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RETINOSIS, RETINITIS EXTERNA AND CHOROIDITIS.

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Retinosis is a better word than retinitis to indicate conditions of the retina which are not inflammatory, but degenerative. The outer layers of the retina nourished from the choroidal capillaries are subject to inflammations properly called retinitis externa. Late stages of retinitis and of choroiditis may present similar pigmentary changes, causing confusion that would not arise were the lesions considered in connection with the anatomy of the parts and the history of their development. This paper to remove confusion and misunderstanding was read before the Colorado Congress of Ophthalmology and Oto-Laryngology, July, 1926.

There is still much confusion and misunderstanding about the classification of certain types of retinal and choroidal diseases. The distinction between internal retinitis and chorioretinitis is fully recognized, but in the last group there are included so many and totally different pathologic complexes, that to make a diagnosis of chorioretinitis has actually the same vague and ill defined meaning as if we spoke of nasal sinusitis, without specifying which cavity or cavities are involved.

A greater scientific precision is necessary in the description and grouping of diseases of the external layers of the retina and the choroid; not only for a greater accuracy of thought and expression, but also for the promotion of our knowledge in this direction. Before entering into the subject of this paper, however, it is important to emphasize the distinction between the reaction to disease and the character of the changes involving the inner layers of the retina (internal retinitis) and those which result from the primary involvement of the external layers (external retinitis).

It is a well known fact that pathologic reactions, to any kind of injury, vary according to the type of circulation and blood supply in a given organ. The inner or cerebral layers of the retina, up to the outer molecular layer, are supplied by the retinal arteries, which form a terminal system. They react to injury in the same way as does the brain, that is, they are more prone to degeneration than to inflammation. The socalled kinds of retinitis are not, in a general way, the result of inflammation but of degeneration.

Instead of "retinitis" a better name would probably be "retinosis" (Osis, condition of), which does not determine anything and only needs the qualification of albuminuric, diabetic, etc., to be accurate. The term "retinitis" must be limited to well defined cases of retinal inflammation. Internal retinoses, as we will call them hereafter, are characterized by white spots and hemorrhages, or diffuse opacities, and in the pure forms, which are confined to the inner layers alone, do not show any pigment changes. The outer layers of the retina, that is the first neuron including the pigment epithelium, are entirely deprived of vessels, and derive their nutrition from the choriocapillaris of the choroid. This fact has been proven by experiments on animals on which the posterior ciliary arteries were divided. An atrophy of the choroid and retina ensued, both membranes becoming adherent, and the pigment from the choroid and pigment epithelium migrating into the inner layers of the retina. The same condition occurs after opticociliary neurotomy due to the section of the arteries, as has been shown by some authors (Wagenmann, Krückmann), and as I was able to observe myself after a Kroenlein operation, in a case of tumor of the optic nerve.

To what extent the outer layers of the retina are dependent on the chorio-

capillaris for their nutrition is shown, also, by the condition of the detached retina; which, deprived of its source of nutrition from the choriocapillaris rapidly becomes opaque, in spite of the wholly preserved circulation of the retinal vessels.

On account of this nutritional dependence, diseases which affect the outer layers of the retina are generally considered and described in the group of choroidal inflammations, and many authors assert that all choroiditides are

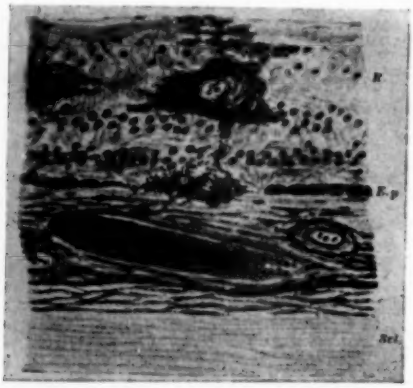

Fig. 1. Pigment collected around the retinal vessels, sheathing them and extending above toward the surface of the retina, R, which is in the course of atrophy. The rods and cones have entirely disappeared. The pigment epithelium, E, is in active proliferation and the melanin granules are seen invading the retina and following the neuroglia to the superficial vessels. The choriocapillaris has entirely disappeared, but the stroma of the choroid is normal. Scl. sclera. (Greeff).

in fact chorioretinitides, always involving the outer layers of the retina.

This is true in a general way, but from the pathologic, and especially from the clinical standpoint, there is a considerable difference between choroiditis and external retinitis. The choroid with its rich supply of blood vessels is more liable to inflammation. The outer layers of the retina on the contrary, nourished only by the diffusion of fluids from the choriocapillaris, usually react by degenerative changes. The whole process may, for a long time or for life, be confined to the outer layers of the retina, and has especial symptoms.

However the interrelations of the two membranes is such, that in later or terminal stages, the pathologic processes either extend from the outer retinal layers to the choroid, or from the outer to the inner layers of the retina.

Degenerative changes confined to the external layers of the retina are either a result of sclerosis of the choriocapillaris, or an independent lesion, an *abiotrophy*, as suggested by Collins. This name however, referring to a lack of vital force whose nature is not known, only covers our ignorance of the true cause of the degeneration.

Let us consider in a general way what happens in external retinosis:

1. To the pigment epithelium,
2. To the rod and cones and visual cells,
3. To the lamina vitrea which divides the choroid from the retina,
4. To the optic nerve.

1. The pigment epithelium reacts to injury either by atrophy and complete absorption, or the reverse by proliferation. In the first case the cells, impaired in their nutrition, disappear and the pigment granules are absorbed without traces; that is the case for instance in high myopia, when a pathologic tesselated fundus appears as the result of the impaired nutrition by the stretching of the globe. This absorption of the pigment epithelium is also present in glaucoma, in congenital syphilis and other diseases. Besides this diffuse superficial depigmentation, isolated patches may occur which have a lighter reddish-brown color than the fundus, and clean cut margins. Inside of them the large choroidal vessels stop abruptly, when reaching the borders.

In other cases, after destruction of the cells of the epithelium, the granules of pigment are dispersed, and become visible as scattered small black dots, pepper and salt fundus, or form a black sandy or granular background. (Fig 1.) When the cells of the pigment epithelium proliferate either they stay in place, or by the destruction of the rods and cones and outer limiting membrane, they travel from the inner to the outer layers of the retina.

It is not well known in which manner this migration takes place. Capauner, Gonin, and Collins and Mayou as-

sume that the cells of the pigment epithelium reassume part of their embryonic characteristics, proliferate, become spindle shaped or spherical, and by their ameboid movements migrate to the inner layers, thru the gaps left in the external limiting membrane by the atrophy of the rods and cones, as them at times in part of their course, or covering them. With the ophthalmoscope, the pigment in these conditions appears branched in the shape of spiders, trees, resembling bone corpuscles, or as a lace like pattern. It may be aptly called *perivascular retinal pigment*. Why the pigment deposits

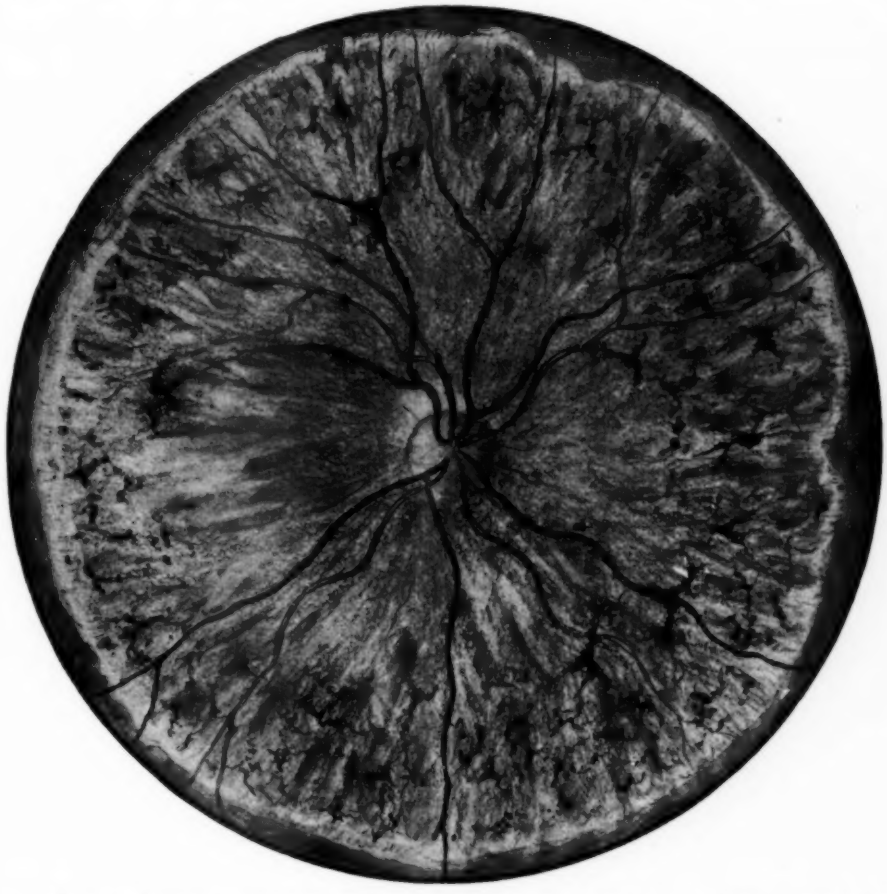

Fig. 2. Primary pigmentary retinosis. The perivascular pigment spots have a bone corpuscle shape, and in some places cover, or sheath the vessels. They are more confluent in the nasal than in the temporal region. The retina had a peculiar gray decoloration; which extended very near the periphery, from which it was separated by a clear cut irregular margin. The color of the disc and vessels was still normal.

we shall see later. Krückmann believes that the glia cells from the supporting framework of the retina take the pigment granulations from the pigment epithelium and travel, following the glia tissues, into the inner layers of the retina.

There the pigment is usually deposited along the small superficial retinal vessels and capillaries, sheathing itself around the vessels, Fig. 2, is not known. Perhaps the granules are taken by the lymphatics (or, as Gonin points out, by leucocytes) and carried into the perivascular lymphatic sheaths, which normally surround the retinal vessels. On the larger retinal vessels, or when filling the cavities formed in the atrophic retina, the pigment spots take a round or irregular shape. The

characteristic feature of the perivascular pigment spots besides the shape, is that they are superficial, a fact that is proven by the covering and sheathing of the retinal vessels, which are sometimes concealed in part of their course. This never happens in true choroiditis, at least in the first stages of the disease.

In former times it was assumed, that this perivascular pigment was characteristic of pigmentary degeneration of the retina. But we know now that it can be present in several forms of external retinosis and in the last stage of chorioretinitis. For this reason the paramount importance given to this superficial pigment for the diagnosis of pigmentary degeneration, is not well founded. The functional symptoms and other characters must be taken into account.

2. The rods and cones degenerate, either as a result of malnutrition in diseases of the choriocapillaris, or due to a special hereditary degeneration of unknown origin, by which they lose their vitality. This has been called by Collins and Gowers, *Abiosis* or *Abiotrophy*, and occurs particularly in pigmentary retinosis (retinitis pigmentosa).

The whole first neuron finally disappears. Later on, the atrophy extends to the inner part of the retina, which in some cases appears veiled and cloudy in a large area around the posterior pole, while the periphery keeps still its red color (Fig. 2). The atrophic retina and the choroid usually become attached by new connective tissue, and this facilitates the passage of the pigment epithelium to the inner retinal layers. In later stages the choroid is involved, and a marked sclerosis of the large vascular trunks is apparent with the ophthalmoscope.

3. The lamina vitrea lines the inner surface of the choroid. This membrane allows the diffusion of fluids, normal and inflammatory, into the retina, but presents a great resistance to the passage of cellular exudation and bacteria; hence the inflammatory foci of choroiditis remain confined to the choroid for a long time, and only produce edema of the retina or a subretinal exudation. For this reason the distinction between choroiditis and external retinosis is usually well marked, at least in the beginning.

In later stages or in acute choroiditis, this barrier is however weakened or destroyed, and the whole retina may be involved in the process. An adhesion between the two membranes result, and the pigment from the pigment epithelium and even the pigment from the chromatophores in the stroma of the choroid, migrate to the inner layers of the retina. This migration, however, is usually discrete and irregular, or limited to a part of the fundus, while in primary retinosis externa the whole periphery is involved.

In some types of external retinosis, for instance in congenital syphilis, white, yellowish, or grayish spots of depigmentation of the lamina vitrea, appear in the periphery of the fundus, or advance toward the disc usually in the lower parts. These spots are generally circular or oval in shape, and have indistinct but regular edges. As they are set on a background of black pigment granules, the name of *pepper and salt fundus* or *snuff fundus* has been applied to the picture. The nature of these spots has not yet been determined. For some authors (Köllner) they are the result of an inflammatory infiltration of the choriocapillaris, due to an intrauterine choroiditis which extended into the outer retinal layers. They represent a terminal process, and usually remain unchanged for the whole of life. No functional symptoms are present. It is possible, however, that they result from the formation of large colloid bodies in Bruch's membrane, which compress and destroy the pigment epithelium. These colloid excrescences are, according to Collins and Mayou, due to the degeneration of the pigment epithelium, which reacquires its hyalin producing capacity and gives rise to nodules upon the inner surface of Bruch's membrane. They are sometimes found on both eyes as an hereditary disease, a form of abiotrophy. Also in old cases

of choroiditis as a result of irritation of the lamina elastica (A. Fuchs).

Small circumscribed white spots have been observed in cases of pigmentary retinosis. The small white spots occurring in retinitis punctata albescens, were supposed by Leber to be similar to the colloid excrescences seen in the socalled "Central Senile Guttate Choroiditis," which sometimes are widely disseminated in the fundus.

4. Atrophy of the papilla: The destruction of the first neuron in some types of retinitis externa could not be produced without the other two neurons and the nerve fibers suffering an ascending degeneration. This is shown first in the field of vision by an equatorial ring scotoma and concentric contraction, and in the papilla, later on, by a retinitic atrophy, with its characteristic yellowish-red color, indistinct margins and thread like arteries and veins.

The pathologic changes studied before will provide a basis for the diagnosis of the different clinical types.

The first important difference between the isolated involvement of the outer retinal layers and the choroidal diseases is, that in the former there are no foci of active inflammation and no white atrophic spots resulting from them, as is the case in exudative choroiditis.

Fig. 3. Fine spotted type of congenital lues (pepper and salt fundus). Round yellowish spots upon a background of fine granular pigment. Mild form (Adams).

The second is the peculiar shape of the pigment which may be called "perivascular" to denote its star or bone corpuscle shape, and its place in the superficial layers of the retina. Even if the pigment has not this peculiar shape, the fact that it is superficial and covers or sheaths the retinal vessels, is sufficient for the diagnosis of a primary or concomitant retinitis externa.

The third is, in some types, the disappearance of the pigment from the cells of the pigment epithelium, laying

bare the great choroidal vessels in patches or in the whole fundus. These are usually normal. When they are sclerosed the diagnosis of a coexistant choroiditis is evident, and we are dealing with a chorioretinitis.

DIFFERENT TYPES OF EXTERNAL RETINOSIS.

1. Changes due to hereditary syphilis.
2. Pigmentary retinosis.
3. Pigmentary retinosis without pigment.

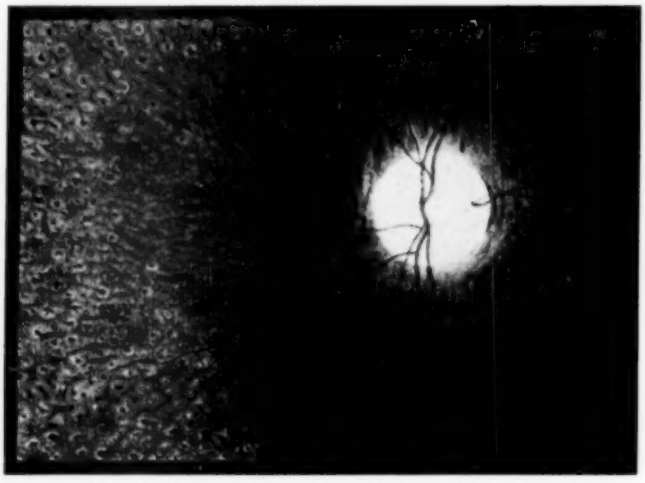

Fig. 4. Fine spotted type of congenital lues. Severe form. The pigment dots are larger and some have the perivascular shape. The yellowish spots are also larger and many have a pigmented center. The retina has a grayish color in the periphery. Retinitic atrophy of the optic nerve, fairly advanced with very narrow vessels. (Köllner).

4. Retinosis punctata albescens.
5. Macular pigmentary retinosis.
6. Hereditary hyalin infiltration of the retina (Doyne).

1. Changes in the retina and choroid, due to congenital lues, have been arranged in several groups. Hutchinson, Haab, Sidler-Huguenin and recently Köller, who have studied this subject, are by no means in accord, and their classifications are at great variance.

The author's experience leads him to divide them into the following groups, which range in severity from the partial stationary type, to the extensive, progressive contraction of the field with impairment of vision. It is to be remarked that the more extensive and severe the disease, the more the lesions approach the posterior pole, the macula being usually respected to the last.

First type—*Pepper and Salt* or *Snuff Fundus*: This is characterized by numerous round, yellowish white, or reddish white, fine spots about the size of a large retinal vein, which are generally located in the periphery of the fundus. In the discreet form the changes may be only suggested. A great dilation of the pupil is sometimes necessary to detect them. In the severer forms they extend toward the macula, being generally more frequent in the lower part of the fundus. Between them a black stippling made of very fine pigment dots forms a sandy, dark, background. In the mild form no functional symptoms exist and the disease is nonprogressive. It is usually bilateral. In the severer forms the pigment, instead of being dispersed like black dust, travels to the surface of the retina, and takes the shape of small perivascular spots or appears as round foci, sometimes sheathing the retinal vessels. The yellowish spots take in some cases a whitish color with a pigment deposit in the center.

An important symptom is the atrophy of the optic nerve (retinitic atrophy) with very contracted vessels, which is probably the result of a severe neuroretinitis of infancy. The vision

is very much impaired as the result of this atrophy and may be reduced to one-half. Contraction of the field of vision and hemeralopia sometimes are present. If the child survives the luetic infection, the retinal disease may become stationary.

Second type: The yellowish, and especially the pigment spots, are here much larger. The latter appear in round or irregular dots, or in coarse lumps, which sometimes blend, making a big patch. The pigment covers, or sheaths, at times the retinal vessels, but generally does not have the perivascular shape. The yellowish spots are larger and more confluent, of a brighter color and have indistinct margins, often forming a halo around the black spots. These lesions are found in the periphery, or the whole fundus, or may be confined to a sector. The yellowish spots are, in some cases, the only lesion, or the reverse, the pigment patches may exist without the white spots. This is especially the case after interstitial keratitis or iritis. It is found sometimes also in high myopia. The vision is only slightly impaired, and very rarely there is hemeralopia or a concentric contraction of the field. The disease is generally bilateral.

Third type: Pigmentary Retinosis of congenital lues, has the same characters as the nonluetic form, from which sometimes it is very difficult to distinguish. The pigment spots are, however, rounder, more irregularly disposed, and blend, forming large patches. The presence of choroidal changes or vascular diseases speaks more for a luetic etiology.

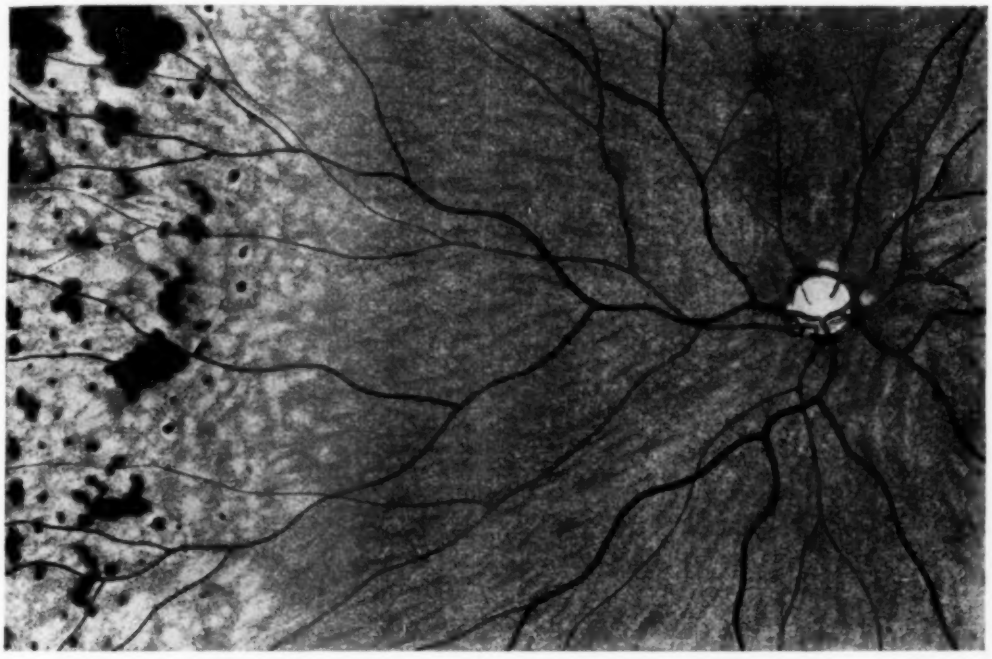

Fig. 5. Coarse spotted type of congenital luetic retinosis. The pigment is collected in larger spots which sometimes coalesce forming great lumps. They are superficial and in places cover the retinal vessels. The yellow spots are of greater size, brighter in color and with indistinct margins. (Haab).

II. Pigmentary Retinosis. Our knowledge of the causes which produce this disease is so scanty, that our classifications must necessarily be only temporary. Pigmentary retinosis is generally described in the group of atrophies of the retina, side by side with other atrophies which are secondary to other retinal, or papillary diseases, altho the pathologic substratum and symptoms are entirely

different for both. Pigmentary retinosis is a primary change, which begins in the outer layers of the retina, with degeneration of the neuroepithelium and then involves the inner layers, particularly the ganglion cells, until the whole retina is atrophic. As stated before, the perivascular pigment is not characteristic of pigmentary retinosis. It may be the result of either a primary disease of the rods and cones and pigment epithelium, an abiotrophy (Collins and Gowers), or depend on sclerosis of the choriocapillaris, or arise in the last stage of a choroiditis, when an adhesion has been formed between the retina and the choroid (secondary or pseudoretinitis pigmentosa).

The lesions in pigmentary retinosis are confined to the neuroepithelium, as has been found by numerous microscopic examinations (Müller, Junge, Schweigger, Collins). Inflammatory changes are never present in the retina. It is not known why the degeneration starts in a zone concentric to the macula, and then spreads to the periphery, leaving the macula intact to the last. Collins and Mayou have observed the complete integrity of the choroid in the earlier stages.

It has been proved that hemeralopia sometimes precedes the appearance of the pigment spots in the retina. This speaks for a primary loss of function of the rods. As in every nervous tissue the degeneration slowly travels to the ganglion cells and from these to the optic nerve fibers hence the retinitic atrophy of the disc.

Whether the extreme contraction of the retinal vessels is the cause of the atrophy of the outer and inner layers, or only a result of the original pathologic cause, is not yet known. Still, it would be difficult to understand how a primitive lesion of the retinal vessels will account for the early atrophy of the neuroepithelium which is nourished by the choriocapillaris. Furthermore in severe sclerosis of the retinal vessels, when they are very much contracted or even occluded, the symptoms, or pigmentary retinosis, never appear. On the other hand the sclerosis of the choriocapillaris, in the luetic form for instance, is capable of producing the pathologic complex of retinitis externa.

The diagnosis of the primary type of pigmentary retinosis must be made:

1. By the distribution of the perivascular pigment which begins in the equator of the eye, usually leaving free at first the extreme periphery of the fundus. The spots are superficial, quite regular in shape, and more confluent in some sectors than in others, usually more in the nasal side.

2. By the earlier onset of hemeralopia and especially the presence of a ring scotoma in the blind region from 8° to 25°, with preservation, in the first stages of the peripheral field. The extent of the ring scotoma is usually much larger than the zone in the fundus occupied by the pigmentation.

3. The early contraction of the color fields.

4. The progressive character of the disease.

5. The extreme narrowing of the retinal vessels and the retinitic atrophy of the nerve.

6. By the absence of any inflammatory, or atrophic foci, in the fundus. In later stages the choroid degenerates, as shown by the sclerosis of the choroidal vessels. The lens opacifies at the posterior pole.

7. By the hereditary character of the disease, sometimes attacking either the males or females in several generations.

8. There are frequently present other degenerations in the internal ear, producing deafness, or in the central nervous system; idiocy, mental deficiency, epilepsy and spinal paralysis.

A variety of this disease is probably the diffuse form of external retinosis, called by Leber "Tapetoretinal degeneration," in which fine diffuse pigmentary changes and white spots are present in the fundus. The disease is always bilateral and occurs in several members of the same family, ends in total, or nearly total blindness, and is frequently associated with cerebral degeneration and idiocy (Amaurotic family dementia).

III. Pigmentary Retinosis Without Pigment: This paradoxical name

is applied to cases in which, with the characteristic symptoms of pigmentary degeneration, there are no perivascular pigment spots present. Some authors (Collins and Mayou) assume that this condition is only the initial stage of the classical form, but it has been observed unchanged in appearance for many years, only the optic atrophy progressing slowly. The retina assumes frequently a diffuse bluish cloudiness.

No microscopic examinations have been made of eyes affected by this condition which will allow us to understand its true nature. However the analogy of the whole symptom complex with the one observed in the ordinary pigmentary retinosis, the pigmentation excepted, warrants its classification in the group of external retinosis. Probably in this condition the pigment epithelium becomes totally atrophic, at the same time that the rods and cones, instead of proliferating, as in the classical type. This panatrophic external retinosis progresses in the same way as the ordinary pigmentary type.

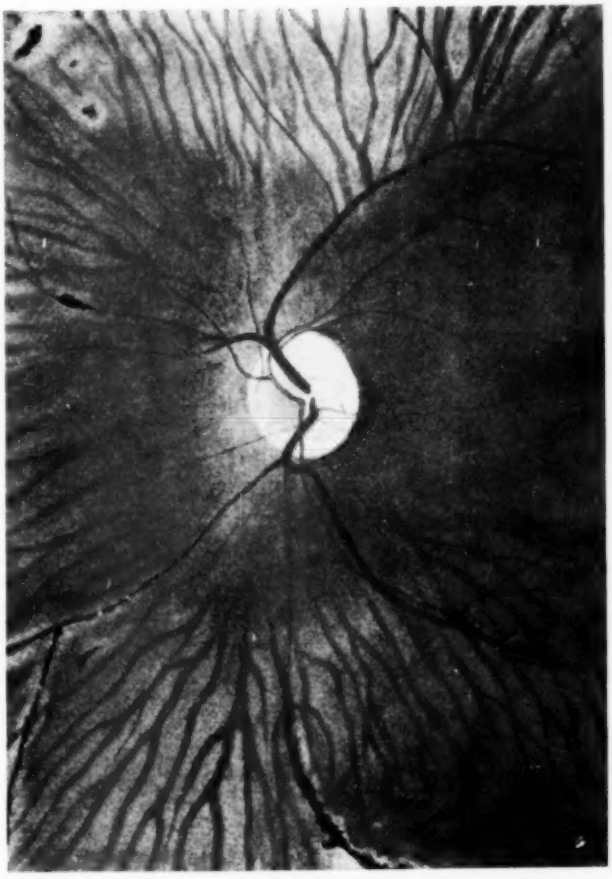

Fig. 6. Pseudoalbinosis of congenital lues. The depigmentation involves the retina and choroid only in the periphery. It is distinguished from a normal fundus by the pigment sheathing the retinal vessels and appearing in detached spots in the periphery. The disc is beginning to atrophy and the arteries are very narrow. (Adams).

IV. Retinitis Punctata Albescens: In this disease the fundus is studded with minute white or grayish white spots, about the size of a retinal vessel of first or second degree. They lie behind the level of the vessels, are never present in the macula, and become less confluent in the periphery. No pigment changes are apparent. The optic nerve is gray in some cases.

The functional symptoms consist of

hemeralopia, which usually dates from infancy, and contraction of the field, sometimes with bright light, in others only by diminished illumination. The disease is congenital, or starts in early infancy, is bilateral and usually non-progressive. Altho no microscopic examination has ever been made in this disorder, the existence of hemeralopia, the congenital character and the absence of other lesions in the choroid, or the inner retinal layers, warrant its classification in the group of external retinitis. Leber thought that the white spots were due to colloid excrescences of the lamina vitrea, partly calcified. He considered this disease as a tapeto-retinal degeneration without pigment.

V. Macular Pigmentary Retinosis: A considerable number of names and descriptions of congenital degenerations of the macular region, are found in the literature, and it will be best for their proper understanding, to arrange and classify them properly.

Leber has described, under the name of *central tapetoretinal degeneration,* a disease which, by attacking the macula, is a frequent source of congenital blindness. It is bilateral and the changes consist in white spots and pigment grains, spread over the maculo-papillary region. There are two forms, according to the age of development: infantile and juvenile. Sometimes its appearance is delayed until middle life, when the impairment of vision ends in an absolute scotoma. Batten and Mayou have described a type of pigmentary retinosis confined to the macula which they call *Symmetric Macular Pigmentary Degeneration.* While in the ordinary type of pigmentary retinosis the changes begin in a zone around the macula, slowly extending outward, in the macular type this structure is the first and only part involved. The lesions consist in an abiotrophy of the cones and the migration of pigment epithelium to the surface. As there are no vessels in the macula, the pigment takes the shape of circular dots, instead of the spider or branching spots. The patch of macular change may have an irregular well defined outline, or blend with the neighboring retina, apparently healthy, or beyond may appear a zone of typical perivascular pigment (Nettleship).

The functional symptoms consist in an early loss of central vision and day blindness, which begins in the first or second decade of life. There are two forms, one in which the lesions are confined to the macula, and another associated with mental defects. They are not hereditary.

H. Gifford has described with the name of *familial retinocerebral degeneration* a similar condition which generally begins at seven years of age in the epoch of the second dentition and in which, besides a superficial pigmentation localized in the macula, there is optic atrophy, with very narrow vessels and a discoloration of the whole retina which takes a lighter color. Later on the mentality of the patient deteriorates gradually, epileptic seizures sometimes appear, and finally the patient becomes imbecile. Stargardt reviewing the literature of this condition places these cases along with those of Mayou, Oatman and Darier in one group under the name of "Familial progressive macular degeneration," which he subdivides into cases with and without cerebral degeneration.

Stock, who has been able to examine microscopically cases of this condition, found the most wide-spread change to be a destruction of the rods and cones, with little change in the optic nerve. Vogt, Spielmeyer and others consider this disease as a juvenile form of amaurotic family idiocy, and Nardin and Cunningham think that the malignancy so characteristic of the latter disease, which is generally fatal, decreases when the etiologic agent attacks older patients, with more resistant tissues and produces either the retinocerebral degeneration at the time of the second dentition; or later, from the fourteenth year forward, changes in the macula only.

Oatman has called this same condition *maculocerebral degeneration;* one type being confined to the macula alone and the other extending to both retina and brain. In the last there is progressive blindness, progressive paralysis and dementia.

Stargardt has described also the same condition as *Progressive family degeneration in the macular region,*

Darier calls it "Progressive familial macular degeneration," and Gifford "Familial retinocerebral degeneration."

It is probable that all these types have a common pathologic basis; viz., an external retinosis, with primary degeneration of the cones in the macula, and migration of pigment to the surface as found by Stock. Leber saw white spots with pigment changes, which have not been recorded by the other authors. However, even in the ordinary pigmentary retinosis, white spots (probably colloid excrescencses), have sometimes been observed in the fundus. Collins and Mayou have found colloid excrescencses present in Bruch's membrane, not only in senile conditions in and near the macula, the other parts of the eye being healthy (Central guttate or Tay's choroiditis), but also as an hereditary bilateral disease, which they believe is a form of abiotrophy.

Fig. 7. Secondary perivascular pigment spots after choroidal degeneration (socalled secondary retinitis pigmentosa).

VI. Hereditary Hyalin Infiltration of the Retina (Doyne's family choroiditis). This is a maculopapillary condition, in which light colored spots form in the macula and around the disc. Pigmentary changes may, or may not, exist. The characteristic feature is the extension of the spots, which become larger and blend forming larger patches. These greatly interfere with central vision. The disease is hereditary and may affect several generations. By microscopic examinations, Treacher Collins has found the white yellow spots to be due to hylalin bodies growing in Bruch's membrane, which slowly increase, compressing the retina. He ascribes them to an abiotrophy of the pigment epithelium.

CHORIORETINITIS.

When the changes are not confined to the outer retina but involve the choroid as well, we speak of chorioretinitis or retinochorioditis. To the symptoms of external retinosis, those of inflammation or degeneration of the

choroid are added. There is a great variety of types of this disease, as in fact this is the outcome of all retinal and choroidal lesions. However, some of the primary conditions will be described.

The primary conditions are: Diffuse chorioretinitis syphilitica (Foerster); myopic; sympathetic; in congenital lues; sclerosis of the choroidal vessels (primary); atrophica gyrata; photogenous and actinic.

It would not be within the scope of this paper to describe in detail all these conditions. I will refer only to the following characteristic types.

1. Superficial and Deep Depigmentation in Congenital Lues. An interesting type of absorption, both of the pigment epithelium and the chromatophores of the stroma of the choroid, is the pseudoalbinosis of congenital syphilis. Besides the superficial depigmentation, which lays bare the normal choroidal vessels, there is a deep depigmentation showing the white sclera thru. These changes are almost always confined to the periphery of the fundus, and can be distinguished from a partial albinism in a normal fundus by a migration of pigment to the superficial layers of the retina, generally sheathing or covering the retinal vessels, or appearing as round spots, surrounded by an atrophic halo. Furthermore, the retinal vessels are frequently very narrow, as the result of the luetic infection. The condition is generally stationary; but in severe cases the whole fundus becomes involved, altho the depigmentation is still more advanced in the periphery, and a retinitic atrophy of the papilla develops.

2. Secondary Retinitis Pigmentosa. In cases of an inflammatory affection of the choroid, spreading to the external retina, or of a diffuse primary inflammation of the retina, particularly of leutic origin, the two membranes become attached, atrophic, and the pigment migrates to the surface of the retina, in the shape of perivascular pigment spots, giving to the ophthalmoscope a picture similar to pigmentary retinosis. This is called secondary retinitis pigmentosa, but a better designation will be chorioretinitis with secondary perivascular pigmentation, as these changes have nothing in common with true pigmentary degeneration, whose functional symptoms and course are entirely different. In this chorioretintis, round or irregular white atrophic spots surrounded by a ring of pigment, or containing black spots inside, are present in the fundus and show its true origin.

Side by side with these lesions a network of superficial perivascular pigment spots are often seen. These, however, are more irregular in shape and accompanied by round black spots. They are sometimes confined to a sector of the fundus. The unilateral character of the disease, in some cases, the irregular contraction of the field, or the presence of patchy scotomas, the history of the case and the late appearance of hemeralopia, if present, will help to distinguish this type from true pigmentary retinosis. However, in many cases this distinction becomes impossible.

In cases of widespread sclerosis of the choroidal vessels, secondary perivascular pigmentation also takes place, as will be seen later.

Vascular Degeneration: The third type is primarily a vascular degeneration which may begin in the choroid but ends as a chorioretinitis. Syphilis, arteriosclerosis, nephritis, diabetes and other diseases produce the gradual sclerosis of the choriocapillaris and of the large choroidal vessels. Usually no inflammatory foci are present. On account of the atrophy of the pigment epithelium the choroidal vessels are plainly visible; the sclerosed vessels show the white lines of perivasculitis with a slender column of blood still preserved in the center. Later on they appear as a white yellow network of occluded cords, which fill the whole fundus. The pigment of the stroma gradually atrophies also; until the intervascular spaces show the sclera thru deep depigmentation. The nerve has the peculiar color and slender vessels of retinitic atrophy.

Migration of pigment to the surface of the retina may occur in the later stages when the whole retina is atrophic and the picture of the socalled secondary retinitis pigmentosa may be produced.

Another form of chorioretinosis,

with atrophy of the external retinal layers and the choroid, limited to a lobulated white ring surrounding a central red area and usually confined to the periphery, has been called by E. Fuchs *Atrophia gyrata choroideae et retinae.* Perivascular pigment is also observed and usually hemeralopia is present.

When these changes occupy the whole fundus, leaving only a central reddish macular area, they have been termed *choroideremia.* Other authors however, consider this last variety as a congenital absence of the choroid.

CHOROIDITIS.

In the first stages of choroiditis the inflammation is limited to the choroid alone. This membrane reacts to infection, first by localized foci, second by diffuse inflammation, and third by vascular degeneration.

1st. Choroiditic foci are probably the result of a primary local inflammation, starting in the vessels and spreading afterwards to the neighboring tissues. In acute plastic choroiditis (the type usually called exudative choroiditis), numerous yellowish white foci, with indistinct margins, are in the beginning the only symptoms of the disease. The retina is edematous and somewhat elevated above the lesions, but in the intervals the fundus looks normal. The retinal vessels and optic nerve show no changes. Very soon pigment changes appear. The foci are surrounded by a ring of pigment, or covered in places with it. Black irregular lumps appear, outside of the foci, the smaller ones sometimes surrounded with a halo. At last round lumps of irregular patches are scattered in the fundus. Altho part of this pigment is due to the proliferation of the pigment epithelium, the chromatophores of the stroma also disintegrate. The pigment remains in the choroid, or between the choroid and retina. It is only in the cicatricial stages of the disease, when both membranes are entirely atrophic, that a secondary discrete perivascular and superficial pigmentation may take place, side by side with the choroidal patches.

After the choroiditis has subsided the atrophic white areas remain as a characteristic sign of the choroidal involvement.

2nd. In diffuse inflammation, generally, both membranes are infected at the same time. The process either begins in the choroid and spreads to the whole retina, or the latter is primarily

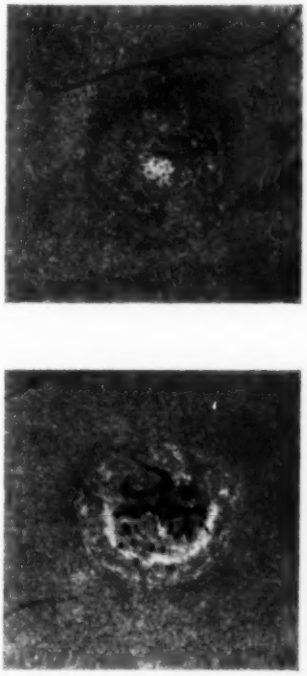

Fig. 8. Macular pigmentary retinosis above. Fine granular pigment covers the macular region. In the center a yellowish-white degenerated spot. Pigment collected in irregular branched figures, a white semicircle upward, and around a pigment ring. The whole macula has a lighter color. (Behr).

infected in its inner layers, and then in its whole thickness and the inflammation spreads to the choroid. The vitreous is filled with exudations. The optic nerve is frequently involved. The most characteristic type of this inflammation is Förster's *Syphilitic Chorioretinitis.*

3rd. The third type is primarily a vascular degeneration of the choroid. Lues, arteriosclerosis, nephritis, diabetes and other diseases, produce the gradual sclerosis of the choriocapillaris and then of the large choroidal vessels. No inflammatory foci are usually present. On account of the atrophy vessels are plainly visible. The sclerosed choroidal vessels show the white lines of

perivasculitis, with a slender column of blood still preserved in the center. Later on they are transformed into a white-yellow network of occluded cords, which fill the whole fundus. The pigment of the stroma gradually atrophies also, until the intervascular spaces show the sclera thru. The nerve has the peculiar color and slender vessels of retinitic atrophy. Migration of pigment to the surface of the retina may occur in later stages, when the whole retina is atrophic, and a picture of the socalled secondary retinitis pigmentosa may be produced.

SUMMARY

There is still much confusion and misunderstanding in the classification of retinal and choroidal diseases. Three groups are generally considered:

1st. One including all diseases of the internal layers of the retina: Internal Retinitis.

2nd. Diseases of the external layers of the retina and choroid: Chorioretinitis.

3rd. Atrophies of the retina and miscellaneous affections.

As the majority of diseases of the internal layers are not inflammatory but degenerative, the author proposes to call them *Retinosis* (Osis, condition of) which, with the qualifications of albuminuric, diabetic, etc., will accurately describe these conditions, reserving the name "retinitis" for the truly inflammatory types.

For a greater scientific precision, the group of chorioretinitis must be divided in two: diseases of the external layers (external retinosis) and choroiditis. This distinction is clearly marked in the first stages of these conditions, altho later on the two membranes become attached and atrophic.

In the third group of atrophies of the retina are now included such different pathologic conditions as the so-called retinitis pigmentosa and the retinal atrophies which are the result of inflammation, thrombosis of the central artery and other miscellaneous affections.

External retinosis results either from sclerosis of the choriocapillaris, or as an independent lesion, an *abiotrophy* (Collins). The pigment epithelium reacts to injury either by atrophy and complete absorption, or the reverse by proliferation. The first change produces the condition of superficial depigmentation, which occurs in a local or diffuse way, in the pathologic tassellated fundus of high myopia, in congenital syphilis, and other diseases. Sometimes, after destruction of the pigment cells the granules of melanin are dispersed, and appear as black dots (pepper and salt fundus).

When the cells of the pigment epithelium proliferate, either they stay in place, or by the destruction of the rods and cones and the external limiting membrane, they travel to the inner layers of the retina, depositing along the small superficial vessels, under the shape of bone corpuscles or spiders. These *perivascular pigment spots* as it would be convenient to term them, are not characteristic of pigmentary retinosis, but can be found in several forms of external retinosis and in the last stage of chorioretinitis. Besides its form, the characteristic feature of the pigment spots is that they are superficial, sheathing or covering the retinal vessels. They also take round or irregular forms, when they fill the superficial cavities of the atrophic retina.

The lamina vitrea presents a great resistance to the passage of cellular exudation and bacteria, hence the inflammatory foci of choroiditis remain confined to the choroid for a long time. For this reason the separation between external retinitis and choroiditis is well marked in the early stages. In the former no active inflammatory foci are ever found and no white atrophic spots.

The yellowish-white spots of pepper and salt fundus have been considered as a depigmentation, which lays bare the membrane of Bruch, or as foci of intrauterine choroiditis. It is possible that they result from large colloid bodies.

A common symptom of external retinosis is the secondary atrophy of the optic nerve, with very small, thread like retinal vessels. Varieties of external retinosis are:

1. Fundus changes in hereditary syphilis. Pepper and salt fundus,

coarse pigment and yellow spots—Pigmentary retinosis.

2. Nonluetic pigmentary degeneration.

3. Pigmentary retinosis without pigment.

4. Retinosis punctata albescens.

5. Macular pigmentary retinosis.

6. Hereditary hyalin infiltration of the retina (Doyne).

1. In the first group are included three types, (A) Pepper and salt fundus; mild and severe forms. (B) Coarse pigment and yellow-white spots. (C) Pigmentary retinosis of congenital lues.

2. The second group is made by the nonluetic type of pigmentary degeneration of the retina. This is a primary external retinosis, which starts in the first neuron. The rods and cones disappear (Abiotrophy). The pigment epithelium degenerates. The atrophy then involves the inner layers of the retina. The pigment travels to the surface and then deposits around the vessels (perivascular pigment), but is not characteristic of this condition alone. The early onset of hemeralopia is indicative of the changes which take place in the rods, and the ring scotoma of a special limited degeneration of the cones, around the macula. The retinal vessels become small and, at last, the optic nerve fibers also degenerate. (Retinitic atrophy.)

3. Pigmentary retinosis without pigment. In this type the abiotrophy involves, possibly, both the rods and cones and the pigment epithelium, at the same time. The last disappears altogether.

4. Retinitis punctata albescens. The functional symptom and the character of this disease warrant its classification in the group of external retinosis, side by side with pigmentary degeneration. The lack of pigment changes in the fundus makes it closer to group No. 3. The nature of the white spots has not been determined.

5. Macular pigmentary retinosis. This is an heterogenous group in which may be included:

a—Central tapetoretinal degeneration (Leber).

b—Symmetric macular pigmentary degeneration (Batten and Mayou).

c—Progressive family macular degeneration (Stargardt, Darier).

d—Familial retinocerebral degeneration (Gifford).

e—Maculocerebral degeneration (Oatman).

All these have in common pigmentary changes which, on account of the lack of vessels in the macula, take the form of round spots and small white spots in the maculopapillary region. They are associated, or not, with degeneration of the brain, and occur in members of the same family. No inflammatory or atrophic foci are observed. The functional symptoms vary from impairment of the central vision and day blindness, to central scotoma and blindness. Doyne's "family choroiditis" only differs from the types above described by the progressive character of the white spots, which form large patches.

CHORIORETINITIS: When the changes are not confined to the external layers of the retina, but involve the choroid as well, we call them chorioretinitis. There is a great variety of types, as in fact this is the last stage of all retinal and choroidal diseases. Three primary conditions are described.

1st. The Pseudoalbinosis of congenital syphilis, in which the depigmentation involves both membranes, and there are superficial or perivascular pigment spots.

2nd. The socalled "Secondary retinitis pigmentosa," which is the last stage of many cases of chorioretinitis, usually from acquired lues.

3rd. The "atrophia gyrata choroideae et retinae" of Fuchs.

CHOROIDITIS: In the first stages the inflammation is confined to the choroid alone. This membrane reacts to infection.

1st. By localized foci.

2nd. By diffuse inflammation.

3rd. By vascular degeneration.

It is especially in the second and third types that a secondary migration of pigment to the surface of the retina takes place, in the cicatricial stages.

CONTACT LOCALIZATION OF INTRAOCULAR FOREIGN BODIES.

JAMES M. PATTON, M.D.

OMAHA, NEB.

With a skilled radiologist, a steady patient and a foreign body large enough to cast a shadow, geometric methods of localization are satisfactory. But if the eyes move during exposure the radiogram may give a false position for the foreign body. Particles of metal fastened to the eyeball move with it, preventing a false impression. Various methods of attaching such localizers are mentioned, and a satisfactory one described in detail. Read before the Colorado Congress of Ophthalmology and Oto-Laryngology, July, 1926.

Given a radiologist who is thorolly familiar with one or other of the recognized geometric methods of intraocular foreign body localizations, a patient who will maintain a constant fixation, an intraocular foreign body that will throw a sufficient shadow, and we will agree that this method of determining the position of an intraocular foreign body leaves little to be desired.

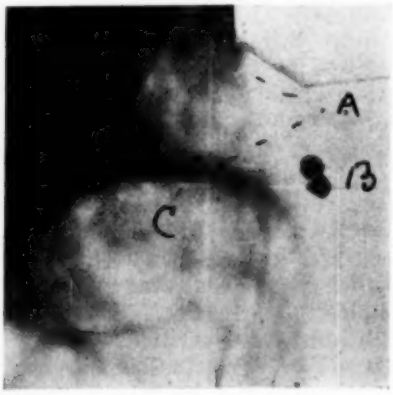

Fig. 1. Markers. (a) Conjunctival markers, (b) Sweet localizer, (c) Foreign body. Note that eye has rotated upward giving incorrect localization by Sweet method.

Unfortunately not all x-ray men are qualified to do this kind of work. The technic is somewhat complicated. Cases are relatively infrequent. The necessary equipment is somewhat expensive; so we can not criticize our radiologist, if he does not show as much enthusiasm for this class of cases as we might wish.

As we are more or less familiar with the geometric methods of localization, and as this paper is particularly concerned with contact localizers, it is sufficient to say that the methods of Mackenzie-Davidson, Dixon, Sweet, and others have their enthusiastic supporters and when properly used give excellent results. The contact method is not intended to take their place, but, as mentioned later, gives valuable additional information; and where the services of a man skilled in the use of the geometric method is unobtainable, furnishes data which are very reliable in most instances.

For a number of years we used the Sweet method of localization, with the addition of conjunctival markers, in all our suspected intraocular foreign body cases. Our radiologist was sufficiently interested to perfect his technic, by careful experimentation with foreign bodies which were placed in the eyes of animals, which were then frozen, x-rayed, and localized, until he was able to submit reports which were very reliable. Subsequent to his moving to another city, we had difficulty in getting any one to take sufficient interest in this method to give satisfactory results, and the following incident lead us to abandon it entirely.

CASE. C. M. T., age 22, consulted us with the history that about two weeks previously while watching a man striking a piece of metal with a hammer, something struck his left eye. The right eye was normal; the left eye deeply congested. There was no evidence of a healed wound of the cornea or sclera but there was a questionable spot near the lower border of the iris which may have been the result of a penetrating wound. The pupil dilated rather easily with a mydriatic, but we were unable to find any evidence of a foreign body in the fundus.

The subconjunctival markers were applied as usual and the patient was sent for a Sweet localization. The report showed a foreign body about one millimeter in extent, one millimeter temporal, and two millimeters back of the center of the cornea, but on examining the film we found that the mark-

ers indicated that the patient had unconsciously rotated his eye upward (Fig. 1), (the Sweet method giving an entirely incorrect localization) and at the same time gave us the correct localization of the foreign body, which was about a millimeter up and in from the lower marker, or almost exactly at the root of the iris. The small bit of steel was then drawn around the pupillary margin into the anterior chamber with the giant magnet and delivered thru a small corneal incision, with the tip of a ring magnet applicator, Dr. Harold Gifford operating. Since then we have relied entirely on the markers, and so far have had no reason to regret it.

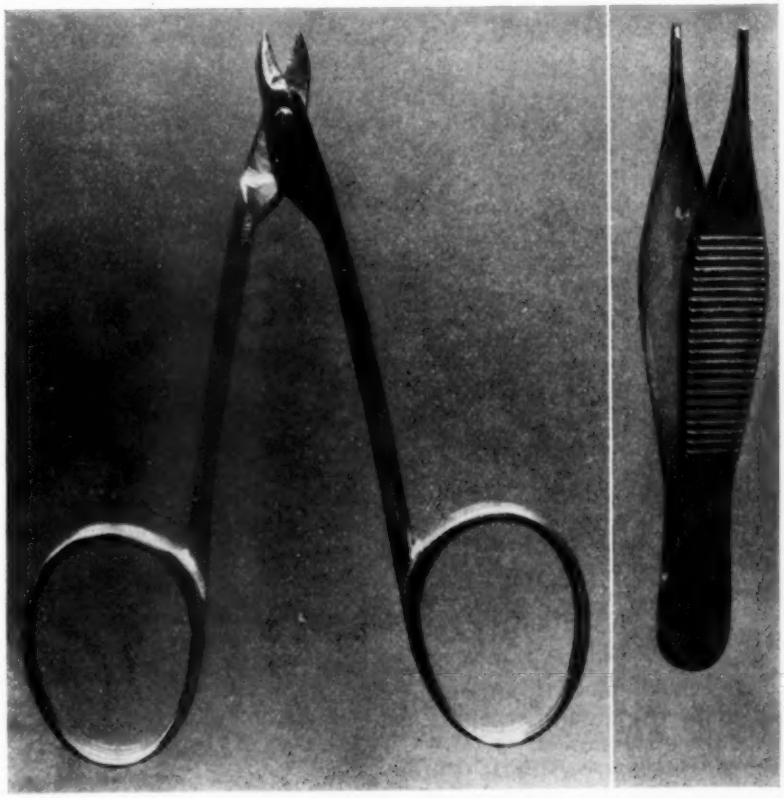

Fig. 2. Forceps and scissors used in applying rings to conjunctiva. Note small groove in tip of forceps blades.

In this connection we should mention the method of localization, advocated by a number of men, which depends on the displacement of the shadow of an intraocular foreign body which occurs when the eye is rotated at the time of exposure. The plate is exposed for the required time with the eye in extreme rotation. The eye is then turned as far as possible in the opposite direction, another exposure made, and the localization estimated by the distance the shadow is displaced on the plate. Verwey[1] has the patient fix a target which is moved a measured distance for the second exposure. Then by using a given mathematical formula, he is able to locate the foreign body to his satisfaction. With the foreign body in a suitable position the rotation method undoubtedly gives useful information. But, as emphasized by Dr. J. Adams[2] commenting on a report of O'Brien's, if the foreign body is located just within, or just outside the sclera, this method is inadequate; and has lead to the removal of eyes which otherwise could in all

probability have been preserved with safety.

With the perfection of the x-ray apparatus, it was natural that one of its first uses should be the detection of intraocular foreign bodies, which was followed promptly by attempts at more or less accurate localization. Various external indicators were tried; cross wires placed opposite the cornea and on the temple, wire or other opaque substances placed on the lids or loose

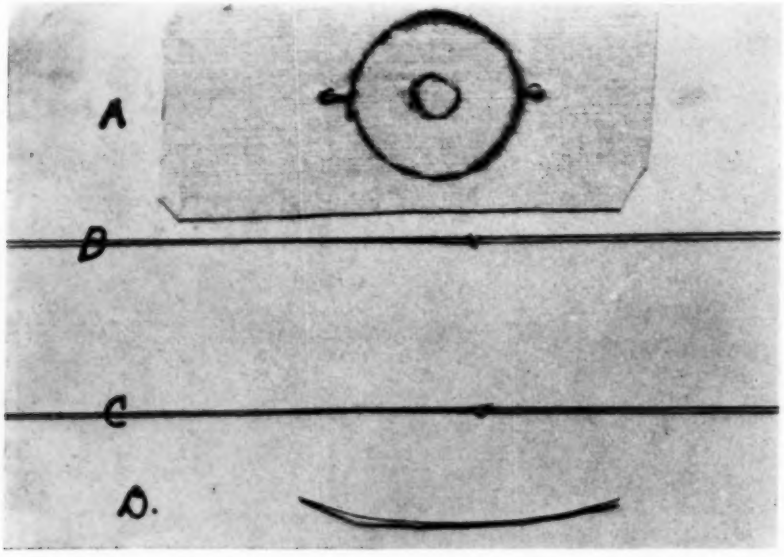

Fig. 3. (a) Silver rings on folds of gauze showing method of application to conjunctiva. (b) Silver wire on suture. (c) Sliver of lead on suture. (d) No. 26 silver suture wire.

in the cul-de-sac; and the method suggested by Dr. Fox of placing an oval ring of wire, inside the lid and reaching the margins of the conjunctival sac surrounding the anterior segment of the globe, were all attempts at localization. They were all, however, open to the objection that the localizer was not attached to the eyeball and that there was no way of knowing the position of the globe at the time of exposure.

Recognizing this, Dr. Harold Gifford for several years had been fastening bits of metal to the conjunctiva in one way or another; and in 1912 reported[3] the use of small bits of wire, two millimeters in length, inserted under the conjunctiva as near the upper and lower margins of the cornea as possible. Pischel[4] advocates the same idea, particularly in connection with one of the geometric methods. This method is very satisfactory in that it gives two definitely known points on the globe from which the localization of the foreign body can be made.

The objection has been raised that this method necessitates wounding the conjunctiva, that there is some difficulty in inserting and removing the markers, and if the subconjunctival pockets are larger than necessary, the marker may move away from the limbus. Holth[5] in 1905 and Lieberman[6] in 1924 advocated suturing small buttons of lead to the conjunctiva, as near the limbus as possible. Lieberman first ties the conjunctival suture, then threads the two ends of the suture thru the button. After the exposure is made, the button is removed but the conjunctival stitch is left in place for a landmark during operation.

In considering a simpler method of applying the markers, Dr. Gifford suggested a number of years ago the use of split bird shot, clamped on a fold of the conjunctiva after the manner of a small boy's fish line sinker, but they were rather bunglesome and either became detached during the exposure, or,

if they were put on with sufficient firmness, were difficult to remove.

Altho they were found to be impractical, they did suggest the use of the rings here presented, resembling those used in marking stock and poultry and known in some localities as hog rings. Shortly after we began using them, Dr. Fred Agnew of Independence, Iowa, suggested the same idea in a letter to me, and this method has undoubtedly occurred to others.

Fig. 4. Radiograph anterior-posterior.

The only essential is a piece of light flexible wire, preferably No. 26 soft silver suture wire. A 2 millimeter ring is made, by bending the end of the wire around narrow forceps and cutting it off with scissors. The conjunctiva is then cocainized, and grasped about three millimeters from the limbus with light mouse-tooth forceps, and the open ring clamped over the conjunctival fold between the forceps and limbus. After the exposure, the ring is easily removed by snipping it with scissors. The forceps and scissors here shown (Fig. 2) were made for me by V. Müller and Company of Chicago and add to the convenience of the procedure, but any flat bladed forceps will close the ring satisfactorily and any light scissors will remove it.

This method has been especially satisfactory on account of the ease of application, and avoids wounding the conjunctiva. Where the rings are not available a short fold of the wire, or a thin sliver of sheet lead, may be clamped onto a light silk suture, the needle passed thru a fold of the conjunctiva as close to the limbus as possible, and tied so that the marker is firmly in contact with the conjunctiva (Figs. 3 and 4.) This marker is easily removed and the slight conjunctival trauma is of no consequence.

Care must be observed in the use of markers that they are sufficiently small so they will not obscure the shadow of the foreign body. An antero-posterior,

Fig. 5. Transverse radiograph. A, Ring markers; B, Foreign body.

and transverse exposure should always be made; and, except under very unusual circumstances, a satisfactory localization can be secured.

A farther aid to localization is secured if markers are placed at the horizontal margins of the cornea as well as above and below (See Figs. 6 and 7). This will show lateral as well as vertical rotation of the globe. As shown in the illustration, rings may be used in one meridian and wire, or lead clamped on sutures, in the other, but this is of no special value as the localizers can be easily recognized by the position.

As stated above, these suggestions are not intended to take the place of geometric localization. When the latter is available it should be employed, always with the addition of the conjunctival markers to avoid misleading findings from an undetected ocular rotation. Place the markers as near the limbus as possible and have them suf-

ficiently small, so they will not hide the shadow of a small foreign body. If the geometric method is not procurable, and there are comparatively few radiologists who are proficient in the technic or who care to bother with it, then I would urge the use of one of the methods mentioned, before resorting to the unguided use of the magnet, or advocating the removal of an eye which might be kept with safety.

1620 *Medical Arts Bldg.*

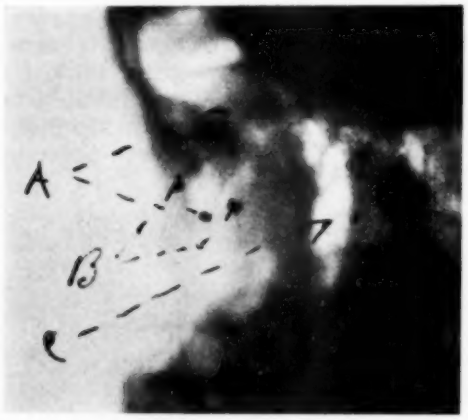

Fig. 6 and 7.—A, Ring markers placed in vertical meridian. B, Slivers of lead in the eye.

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ANNULAR MALIGNANT MELANOMA OF IRIS, RING SARCOMA.

WILLIAM R. MURRAY, M.D.

MINNEAPOLIS, MINN.

A young man noticed change of color in his right iris and later dilatation of the pupil. At the end of twenty months there was increased tension and deep glaucomatous cupping of the optic disc. The eye was enucleated showing the periphery of iris thickened, filtration angle obliterated, pigmented areas on iris. The tumor was composed of round and spindle shaped cells and extended into the corneal limbus and ciliary body. Read before the American Academy of Ophthalmology and Oto-Laryngology, September 16, 1926.

Annular malignant tumors of the iris and ciliary body are of comparatively rare occurrence. I have been able to find in medical literature, seven reported cases of malignant annular tumor of the iris and thirteen cases of malignant annular tumor of the ciliary body. The following case seems worthy of report:

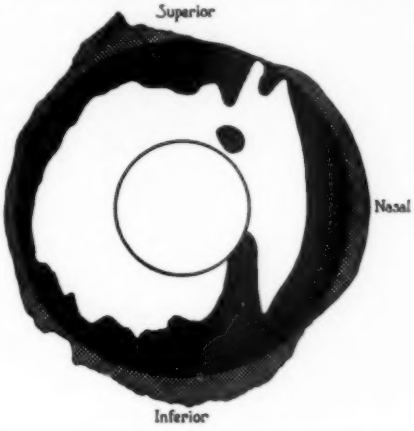

Fig. 1. Graphic reconstruction of annular tumor of the iris. (Left eye X 20).

A farmer, aged nineteen years, entered the University Hospital December 1, 1924, complaining of loss of vision in the left eye. He stated that his parents had first noticed a change in the color of his iris in February, 1923, and a few months later he noticed that the pupil of the left eye was somewhat larger than that of the right eye, and that the pupil had gradually increased in size. He had not, however, noticed any change in vision in the left eye, until three weeks before entering the hospital. There was no history of injury and there had not, at any time, been pain or discomfort in the eye.

Present Condition: In the left eye there was a mild injection of the vessels in the bulbar conjunctiva, and there was a deep injection of the ciliary vessels. The cornea was clear; the anterior chamber was very shallow; the pupil was immobile, dilated, oval, with its long axis vertical. Examination of the iris showed areas of dark pigmentation, which were apparently not raised above the level of the remaining portion of the iris. These pigmented areas extended from the ciliary portion of the iris toward the pupillary margin. They varied in size and were present, at irregular intervals, around the circumference of the iris. The iris, between the areas of pigmentation, was of normal color. There was a marked ectropion uveae present, the pigment epithelial layer of the iris presenting a marked pro-

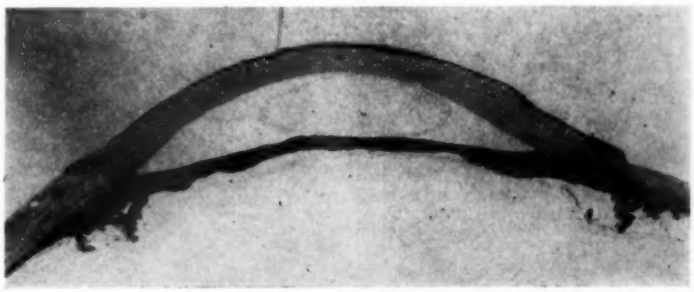

Fig. 2. Section showing blocking of angle of anterior chamber. Extensive invasion of iris stroma with tumor cells. Ectropion uveae.

liferation around the entire pupillary margin. There were no blood vessels to be seen on the iris surface and no circumscribed tumor of the iris.

The capsule of the lens showed the presence of former posterior synechiae, there being three small irregularly shaped brownish pigmented spots where the pigment layer of the iris had been attached. The lens was otherwise clear. The vitreous was clear and the retina showed no abnormality, except a few small pigmented spots, which were observed along the course of the superior temporal vessels. The optic disc presented a deep glaucomatous cupping, and there was an optic nerve atrophy present. The tension was 45 mm. (Schiötz), and vision equaled perception of light. Transillumination of the eyeball was negative.

The right eye showed no pathology. Tension was normal and vision equaled 20/20.

A diagnosis of intraocular tumor with secondary glaucoma and optic nerve atrophy was made, and enucleation advised.

December 4, 1924, the left eyeball was removed and a letter from the patient, received July, 1926, stated that there had been no recurrence of the growth nor evidence of metastasis. The enucleated eyeball was fixed in formalin solution and sent to Doctor W. E. Camp, to whom I am indebted for the pathologic findings.

PATHOLOGIC EXAMINATION.

Macroscopic: Gross diameters of the eyeball are about normal. The cornea is clear. The anterior chamber is shallow. The pupil is dilated and oval in outline. The iris is thickened in its peripheral portion, and is adherent to the cornea thruout its circumference, in the region of the angle of the anterior chamber, obliterating the filtration angle. There is a marked ectropion of the pigment epithelium of the iris at the pupillary margin. There is no circumscribed tumor to be seen in the iris, and there are no isolated nodules present. Pigmented areas are present on the surface of the iris, extending from the periphery towards the pupil margin. The lens is clear, pushed slightly forward, and has several small pigmented spots on its an-

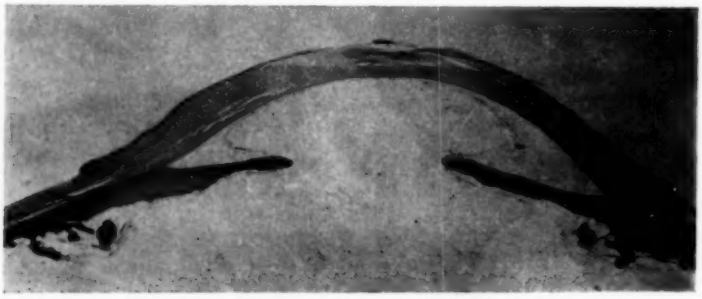

Fig. 3. Section thru pupil area showing infiltration of iris and ciliary body and blocking of angle of anterior chamber. Ectropion uveae.

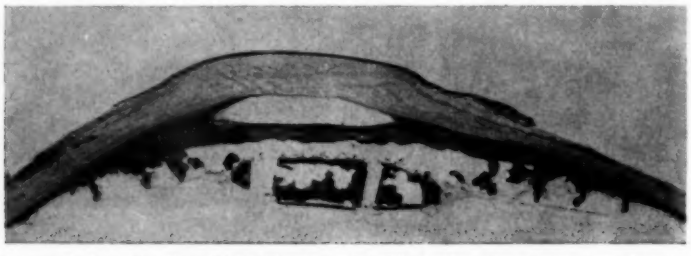

Fig. 4. Section near limbus showing iris infiltration, blocking of angle of anterior chamber and extension of tumor cells on endothelial layer of cornea.

terior capsule. Otherwise the lens appears macroscopically to be normal. The vitreous is clear and the choroid and retina appear to be normal. The optic nerve is deeply cupped.

Microscopic: A portion of the eyeball was embedded in paraffin and a portion was embedded in celloidin. Serial sections, cut in a sagittal plane, were made at intervals of 10 to 15μ and stained with hematoxylin and eosin.

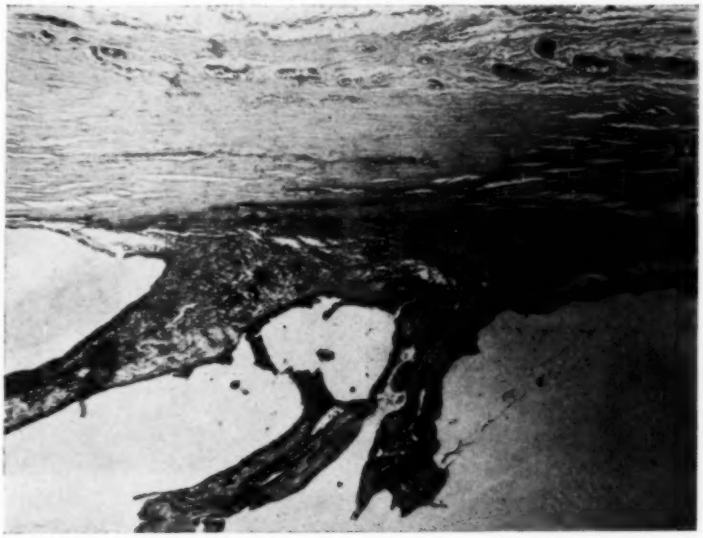

Fig. 5. Section showing root of iris and ciliary body. Dense infiltration of root of iris and ciliary body with tumor cells.

The corneal epithelium, Bowman's membrane, corneal stroma and endothelium are normal. The conjunctival vessels at the limbus are congested, but there is no infiltration or chemosis, and there is no evidence of an epibulbar extension. The anterior chamber is shallow. The iris is considerably thickened at its root and is adherent to the posterior surface of the cornea, at the angle of the anterior chamber, for a distance of ½ to 1½ mm. around its entire circumference. This thickening of the iris is due to an annular tumor involving the entire circumference of the iris in its peripheral half, and completely blocks the filtration angle.

The tumor is composed of round and spindle shaped cells, many of which are deeply pigmented. In places where the cells are more densely packed, polygonal cells are present and there is a tendency to alveolar formation. The nuclei are round and oval and are deeply stained. There are a few mitotic figures present. There are no giant cells, no hemorrhages or necrosis, and no perivascular arrangement of the cells. In the mass filling the filtration angle, the tumor cells are more loosely packed and extend up on the posterior surface of the corneal limbus, covering the corneal endothelium from ½ to 1 mm. beyond the line of adhesion of the iris to the posterior corneal surface. The tumor cells extend into the meshes of the pectinate ligament and the anterior portion of the ciliary body. Schlemm's canal is surrounded by tumor cells. In many places the deeply pigmented anterior border layer of the iris can be followed thru the tumor tissue. Small tumor masses of variable size can be found scattered thruout the whole extent of the iris stroma. The major and minor iris arterial circles are surrounded by tumor cells, and there is a beginning extension into the sclera along the anterior ciliary vein.

The dilator and sphincter muscles are not involved in the tumor growth, and only at one point do the tumor cells extend to the sphincter. There is

a marked ectropion of the pigment epithelium, extending around the pupil margin and in places extending along one-half of the anterior surface of the iris. The pupillary portion of the iris is from ½ to ⅓ the thickness of the peripheral portion. There is no epibulbar extension of the growth.

The ciliary body is thinned, elongated and atrophic. The ciliary processes are normal. The anterior

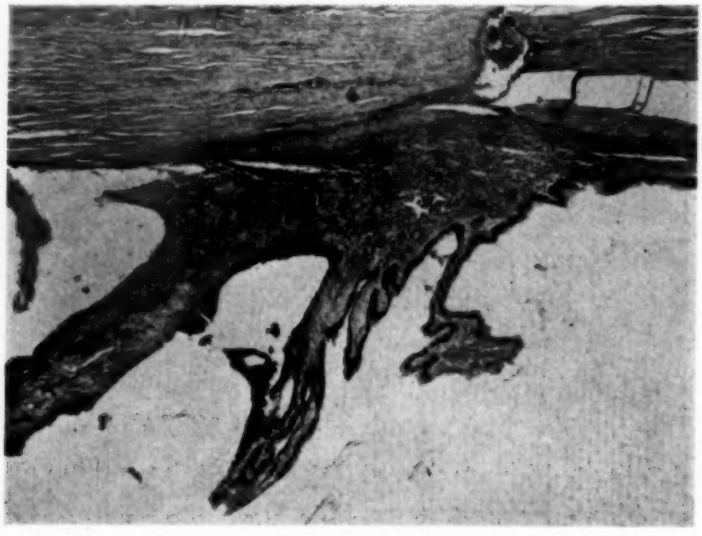

Fig. 6. Section showing root of iris and ciliary body with extension of tumor cells along anterior ciliary vein.

half of the ciliary body is invaded by dense masses of tumor cells, wedged in between the ciliary muscle fibers and the ciliary epithelium. The lens is normal except for a few pigment deposits on its anterior capsule, from posterior adhesions. The vitreous and choroid are normal. The retina shows postmortem changes and fragmentation from sectioning. The optic disc shows a deep glaucomatous cupping which is filled with glial tissue, newformed connective tissue and blood cells.

Diagnosis: Annular malignant melanoma of the iris, with extension to corneal limbus and ciliary body.

REMARKS.

Malignant tumor invading the circumference of the iris, or of the ciliary body, was described in 1898 by Ewetzky, who reported such a growth invading the ciliary body and iris, and described it as a "ring sarcoma." Vose Solomon (1882) described a case of melanosarcomatous tumor of the iris, in which the angle of the anterior chamber was infiltrated thruout the whole circle, by masses of tumor cells which passed into the meshes of the ligamentum pectinatum and thence proliferated into adjacent structures. Solomon's case is the first that I have been able to discover, of that type of uveal tumor, which was later described by Ewetzky as a "ring sarcoma."

Ring sarcomata of the iris and ciliary body apparently belong to the diffuse type of tumor, described by Fuchs (1882), who first distinguished between circumscribed and diffuse sarcomata of the uveal tract. According to Parsons, the diffuse sarcomata differ from the circumscribed type, in that they infiltrate wider areas, producing more or less thickening of the choroid, ciliary body and iris without the formation of a definite tumor. Parsons further classifies the diffuse sarcomata into two subgroups, flat sarcomata and ring sarcomata. In ring sarcomata of the iris and ciliary body, there is usually a definite circumscribed growth combined with diffuse

infiltrating extensions which produce the annular tumor, thereby differing from the flat sarcomata of the choroid, which do not occur as definite circumscribed growths.

In the above case, the iris is involved in the tumor growth thruout its entire circumference in its peripheral portion; and the angle of the anterior chamber is infiltrated with tumor cells thruout its entire extent, the tumor cells infiltrating the meshes of the pectinate ligament, extending along Schlemm's canal, and in places beginning to extend along the ciliary veins.

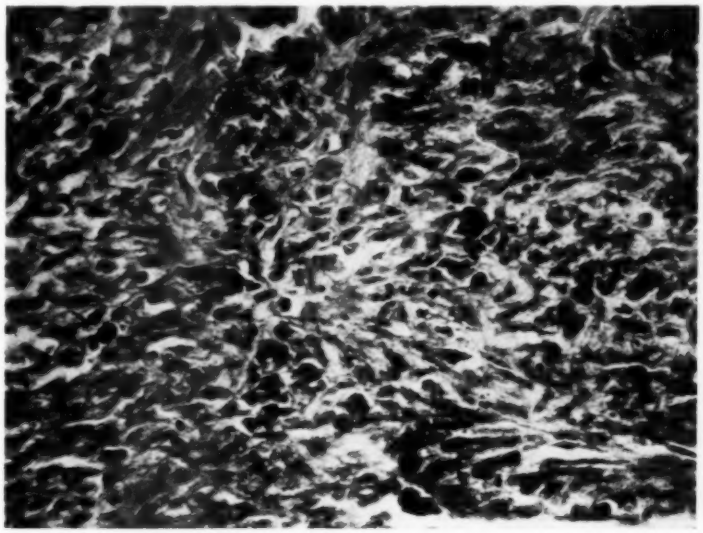

Fig. 7. Section of ciliary body near root of iris. High power showing spindle cells.

Annular sarcomata may have their origin within the iris and extend around the entire iris root and filtration angle, or they may originate within the ciliary body and thence by extension form a complete ring within the ciliary body, or the tumor may invade both the iris and ciliary body, to such an extent that it may be difficult to determine the primary site of the growth.

A review of the literature shows a total of twenty published cases of annular malignant tumor of the iris or ciliary body or of both combined. Annular tumors of the iris have been reported by Solomon[1] (1882), Hanke[2] (1898), Meyerhof[3] (1902), Alt[4] (1911), Laven[5] (1913), Li[6] (1923) and Bruner[7] (1924). Annular tumors of the ciliary body have been reported by Groenouw[8] (1899), Meyerhof[3] (1902), Parsons[9] (1903), Werner[10] (1904), Wintersteiner[11] (1907), Bergmeister[12] (1910), Alling and Knapp[13] (1912), Ischreyt[14] (1912) and Gibson[15] (1922). Annular tumors of the ciliary body and iris have been reported by Ewetzky[16] (1898), Kopetzky[17] (1901) and Pindikowski[18] (1914).

Annular tumors of the iris and ciliary body apparently are of long duration and have a tendency to grow slowly, in this respect resembling the flat sarcomata of the choroid; and also in this respect resembling the circumscribed sarcomata of the iris, which may be present for years without causing subjective symptoms. In Solomon's case there was evidence that the tumor had existed for twenty years; in Ewetzky's case, at least eighteen years; in Kopetzky's and Pindikowski's cases, nine years. In the other reported cases the recorded duration of the tumor was from one month to several years.

Glaucoma is a frequent complication, especially in those cases in which

there is an extensive ring formation, due to blocking of the filtration angle. Intraocular tension was increased in thirteen of the reported cases; normal in four cases, minus in one case (Groenouw); and not mentioned in two cases.

A deep anterior chamber was present in five of the published cases; shallow in five cases; normal in two cases; not mentioned in eight cases.

In fifteen of the twenty cases published, the tumor was pigmented. In the cases reported by Meyerhof (case iv), Groenouw, Parsons, Wintersteiner and Ischreyt, the tumor is described as a leucosarcoma; and in those cases of unpigmented tumors, the age of the patients varied from fourteen to seventy-two years.

The cases reported by Solomon, Hanke, Meyerhof (cases vi and vii),

Fig. 8. Section of iris stroma showing infiltration with tumor cells and pigment.

In their reported cases of ring sarcoma of the iris, Li and Bruner refer to the similarity of the glaucoma present to that of a buphthalmos, as the anterior chamber was deeper than normal and there were no anterior synechiae present.

Pain is a variable symptom, being present in eight cases; absent in nine cases; not mentioned in three cases. In four of the nine cases in which there was no history of pain, hypertension was present.

Epibulbar extension is of frequent occurrence and may occur comparatively early. It usually occurs by extension of the tumor cells to the ligamentum pectinatum and Schlemm's canal, and along the perforating anterior ciliary vessels, especially the veins. In eleven of the reported cases, epibulbar extension of the growth is definitely described.

Alt, Laven, Li, Bruner, Ewetzky, Kopetzky, Parsons, Werner, Wintersteiner, Bergmeister, Alling and Knapp, Ischreyt and Pindikowski are cases of complete annular sarcomata of the iris or ciliary body. In Groenouw's case the ring formation of the tumor invaded the lower half of the ciliary body; in Meyerhof's (iv) case, there was an incomplete ring formation, and in the case reported by Gibson, the lower half of the ciliary body showed an annular extension.

Li has defined ring sarcoma of the iris, as a sarcoma in which the tumor extends thruout the entire circumference of the iris root and the filtration angle, forming a complete ring around it; and a ring sarcoma of the ciliary body as a sarcoma which extends thruout the whole circuit of the ciliary body, forming a complete ring within it. According to Li's definition, some

of the reported cases must be classed as incomplete ring sarcomata. However, as Alling remarks, whether the ring is complete may be of little importance, for it is known that the tendency of these growths is to progress and to invade the whole anterior uveal tract.

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ANNULAR MALIGNANT TUMOR OF THE IRIS AND CILIARY BODY.

Author	Age	Sex	Symptoms	Duration	Anterior Chamber	Annular Tn.	Annular Extension	Microscopic Examination	Epibulbar Extension
1. Solomon 1882	43	F	Failing vision, recent pain. Noticed pin-head size growth iris, increasing size.	20 yrs.	Shallow	N.	Complete in Iris	Spindle, round and globular cells. Pigmented. Angle ant. chamb. infiltrated tumor cells. Lig. pect. and Schlemm's canal invaded.	Not mentioned
2. Hanke 1898	63	F	Vision failing 9 mos. Blind 2 mos. Cataract, pain, ciliary injection, cornea hazy.	9 mos.	Shallow	+	Complete in Iris	Spindle and polygonal cells. Aveolar. Few giant cells. Pigmented. Cellular infiltration in circumference filtration angle. (endotheliomata).	+
3. Meyerhof Case vi, 1902	51	M	Blindness, cataract, no pain.	?	?	+	Complete in Iris	Small, round and spindle, polygonal. Pigmented.	+
4. Meyerhof Case vii, 1902	?	?	?	?	?	+	Complete in Iris	Spindle and polygonal cells. Pigmented.	+
5. Alt 1911	49	F	Dim vision, pain, noticed dark spot iris no. of yrs.	No. of yrs.	Shallow in lower part	+	Complete in Iris	Spindle cells. periphery iris thickened by tumor. Pigmented.	−
6. Laven 1913	12	F	Ant. ciliary vessels injected. Noticed pigmented area iris, increasing size.	Several years	?	+	Complete in Iris	Spindle cells. oval and long nuclei. Pigmented.	+
7. Li 1923	22	M	Blurred vision. Eyeball inflamed at times. Noticed several dark spots iris.	1 mo.	Deep	+	Complete in Iris	Spindle cells, round and oval nuclei. Schlemm's canal and neighboring vessels filled tumor cells. Pigmented.	−
8. Bruner 1924	43	M	Failing vision 5 mos. pain, ciliary injection, cornea steamy. Small brown spot iris increasing in size.	5 mos.	Deep	+	Complete in Iris	Small round cells. Entire circumference lig. pect. invaded. Pigmented (slight).	Not mentioned

Author	Age	Sex	Symptoms	Duration	Anterior Chamber	Annular Tn.	Annular Extension	Microscopic Examination	Epibulbar Extension
9. Murray 1926	19	M	Failing vision 3 wks. blindness. no pain. noticed change color of iris. Pupil dilated.	22 mos.	Shallow	+	Complete in Iris	Round and spindle cells. In places polygonal and alveolar formation. Few mitotic figures. Tumor invades periphery iris and lig. pect. Pigmented.	−
10. Ewetzky	39	F	Dim vision. rainbow colors. iridodialysis. pupil dilated. ciliary congestion. portion of cornea hazy.	18 yrs. Recurrence after iridectomy 11 yrs. before	N	+	Complete in ciliary body and iris	Spindle and round cells. Pigmented. (slight).	Not mentioned
11. Groenouw 1899	28	M	Failing vision. cataract. no pain. Noticed discolored iris.	11 wks. injury eye 9 weeks before	Deep	−	Incomplete in ciliary body.	Cells of various size and structure. polygonal, round spindle. Large round or oval nuclei. Alveolar formation. Leucosarcoma.	+
12. Kopetzky 1901	20	M	Pain, dim vision. Noticed brown spots iris.	9 yrs. Iridectomy for sarcoma 9 yrs. before	Shallow	+	Complete in ciliary body and iris.	Spindle cells, invaded filtration angle. Pigmented.	−
13. Meyerhof Case iv, 1902	72	M	Failing vision, no pain, few dilated conj. vessels. Noticed growth on iris.	1 mo.	?	N.	Incomplete in ciliary body.	Small round cells. spindle cells in alveolar form near ora serrata. Leucosarcoma.	Not mentioned
14. Parsons 1903	14	M	Failing vision. enlargement eyeball ciliary-staphyloma.	? Injury 7 yrs. before	Deep	+	Complete in ciliary body.	Spindle cells, large oval nuclei. meshes lig. pect. Schlemm's canal filled tumor cells. Leucosarcoma.	+
15. Werner 1904–1905	18	M	Failing vision. noticed coai black spots iris no pain.	9 mos.	Deep	+	Complete in ciliary body.	Spindle, large, round, polygonal. alveolar formation. Pigmented.	+
16. Wintersteiner 1907	?	F	Pain. blind 2 yrs. tumor at corneoscleral margin.	8 yrs.	?	+	Complete in ciliary body.	Small cell sarcoma. Pigmented.	+
17. Bergmeister 1910	61	M	Failing vision. no pain. iridodialysis. dark spots iris.	6 mos.	N	N.	Complete in ciliary body.	Spindle and round cells. Pigmented.	−
18. Alling and Knapp 1912	60	F	Failing vision for 2 yrs. dark spot on sclera 1 yr. pain. pigment spot on iris.	2 yrs.	Shallow	+	Complete in ciliary body.	Spindle cells. free pigment cells with large nuclei.	+
19. Ischreyt 1912	50	M	Failing vision. no pain. noticed small tumor at corneoscleral margin.	3 mos.	?	N.	Complete in ciliary body.	Round cell sarcoma alveolar. nonpigmented.	+
20. Pindikowski 1914	50	F	Pain. dim vision. first noticed small pigment spots iris increased size.	9 yrs. Iridectomy for sarcoma iris 1 yr. before	?	+	Complete in ciliary body and iris.	Spindle cells. Pigmented.	+
21. Gibson 1922	45	M	Noticed growth in lower-outer part of ant. chamber.	1 mo.	?	+	Incomplete in ciliary body.	Spindle cells. Pigmented.	Not mentioned

OPHTHALMIC PLASTIC SURGERY. CLINICAL PROCEDURE IN CERTAIN CASES.

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DETROIT, MICHIGAN.

In the choice of grafts and flaps for lid repair epidermic grafts may be employed. The technic of cutting such grafts and the after care of them is discussed. Details of operations for ectropion and symblepharon with restoration of the cul-de-sac are particularly considered. Read before the American Academy of Ophthalmology and Oto-Laryngology, September 24, 1926.

No attempt is made in this paper to cover the whole field of plastic surgery of the lids and orbit. Only such methods of procedure are considered as have come under the observation of the author, in sufficient number to enable him to form an opinion as to the value of a certain procedure in a given case. This does not mean that other procedures may not be equally successful, but that the average results have been more satisfactory by those adopted.

The discussion which follows will be considered under the following headings:

1. Choice of grafts and flaps.
2. Cutting epidermic grafts.
3. Management of grafts and flaps.
4. Correction of certain deformities.

CHOICE OF GRAFTS AND FLAPS: The choice of grafts and flaps has been governed largely by the fancy of the operator, rather than by consideration of the physiologic function of the part involved. In reference to this point, I quote by permission an opinion recently given by Dr. V. P. Blair:

"In the parts of the face that are most concerned in expression, the brow, the eyelids, the alae of the nose, the lips, and to some extent the chin, —the muscles concerned lie almost immediately under the skin or are attached to the skin. In replacing lost skin in these parts, it should be a free skin graft carrying no subcutaneous tissue, for any appreciable amount of the latter will nullify the action of those muscles. This refers particularly to the eyelids and lips where the full thickness of the skin has been destroyed, but where at least some of the muscles remain." Wheeler also has emphasized this same point by recommending that the skin of the brow or lid be utilized in lid repair.

While there seems to be a general tendency in favor of using whole skin grafts, I am still of the opinion that in lid repair, epidermic grafts may frequently be employed with good ultimate results.

CUTTING OF EPIDERMIC GRAFTS will be facilitated by smearing the prepared surface and the razor, which must be sharp, with a layer of sterile vaselin. By this means, a large thin graft that will not curl up, and is easily applied to the prepared surface or to the mold, can be readily cut.

The use of vaselin in cutting epidermic grafts is advocated for the following reasons:

1. Very thin grafts that are regular in shape are more readily cut.
2. Grafts do not curl up and are, therefore, more easily handled.
3. The grafts tend to adhere to the mold, or prepared surface.
4. The healing process is not disturbed.

Transfer the graft directly from the razor to the surface to be grafted. This can be readily done after putting a few drops of a saline solution on the razor, encouraging it to flow under the graft.

If the surface cannot be covered by a single epidermic graft, others may be applied, overlapping the original one, 3 or 4 mm. When grafts are to be applied to a mold, they should be adjusted so that there is the least possible danger of disturbing them, when placing the mold in position. That is, the line of overlapping should be in the line of force applied to introduce the mold. This suggestion applies especially to operations for cul-de-sac restorations.

After the epidermic grafts are in position, one of several details may be observed. If the graft is large enough to cover the whole surface to be grafted, after the dressings are applied, no sutures are necessary. On the other hand, if there is the least probability of the graft being pressed away from the edge of the prepared surface, sutures should be inserted in sufficient number to insure perfect contact. If sutures are necessary, the needle should be entered thru the graft first, then thru the edge of the skin. By this procedure, the sutures are more easily introduced and there is less danger of disturbing the graft.

In general, if the conjunctiva is intact the use of epidermic grafts is to be preferred. On the other hand, if the whole lid is involved in the destructive process, whole skin grafts are to be employed.

Correction of Certain Deformities. *Ectropion.* Ectropion may be partial or complete and either lid may be affected. The surgical management of the senile form of ectropion, due to hypertrophic conjunctivitis, has been reduced to one of two procedures. When the ectropion is of moderate degree, the Ziegler galvanocautry puncture will frequently suffice. When employed, the punctures must pass thru the tarsal plate. If the Ziegler puncture fails to correct the ectropion, it may be repeated; or if eversion is extensive, a blepharoplasty is resorted to, after the method of Kuhnt-Szciminoski —a combination of sliding the lid outward, together with the removal of a triangular piece of cartilage and conjunctiva. In removing the triangular piece of skin, the base of the triangle should run up and out from the external canthus, at an angle of 45°, and not horizontally as is so often illustrated. Excision of a portion of the skin, or of the tarsus and conjunctiva alone, has not proved, in my hands, so successful as the combination of the two procedures, after the method of Kuhnt-Szciminoski.

Scar tissue contraction ectropion may vary in degree from a slight linear scar to a complete evulsion of both cul-de-sacs. When the scar is small and linear, and within the lid, it may be resected and the lid margin restored by the socalled V-Y operation. This procedure, however, is effective only when a small portion of the lid is everted. My impression is that I have had quite as many unsatisfactory as satisfactory results, following operations after this procedure. As stated by Spaeth, "It will assist very much in the placing of the sutures if the two linear incisions are made continuous with the base of the triangle for a distance of 3 or 4 mm., bent downward slightly, and then undermined, it being a modification first mentioned by Dieffenbach."

When the ectropion is extensive and the conjunctiva is intact, the most satisfactory results have been obtained by the employment of epidermic grafts after the following procedure. An incision is made along the lid margin (wherever it may be located), immediately outside the hair line. The lid is dissected free, care being taken to keep the lid thin. The dissection should be so free that the lid will rest in its proper position without traction. If the correction is to be made in the lower lid, it should be turned over the upper lid and held in this position of overcorrection, by sutures passed thru the lid margin and attached to adhesive tape on the forehead. After the bleeding has been controlled, the whole surface is covered with an epidermic graft. The grafts should overlap the skin edges 3 or 4 mm. If for any reason the graft does not "seat" perfectly and remain in position, sutures may be introduced. Otherwise, the dressing may be applied. If both lids are everted, a second operation following the same procedure is necessary. Occasionally in extreme cases, a third operation is necessary to restore the canthus. Even so, each operation requires but a week or ten days, and later, if necessary, the canthus can be restored. By this procedure, the inconvenience to the patient, incident to having the lids closed for a period of months, is avoided.

The form of dressing to be applied, will vary with the character of the surface to be grafted. If the surface is small and smooth, the graft will "take" if no dressings are applied. Experience has proved, however, that the immediate results are better if pressure is applied. If the surface is large and not crater like, the graft may be covered with strips of rubber, about 10 mm. wide, laid on overlapping, or if a little more pressure is needed, a disc of dental material, or of wax and paraffin in equal parts, may be molded over the graft and surrounding parts.

If the surface is uneven, or crater like, or if the surrounding skin shows a tendency to overlap, an impression of the prepared surface may be taken, by pressing into it soft dental material, or a combination of wax and paraffin. This procedure insures perfect contact, of the graft and the area to be grafted, as the mold, pressed into the wound, smooths out the soft tissues and reaches the uneven surfaces, thus advantageously enlarging the area to be grafted. After the mold sets, it is removed and the surface of the mold bearing the impression of the area to be grafted, is covered with an epidermic graft, slightly overlapping the area, and the mold replaced. Gauze saturated with sterile vaselin is then overlaid, all held in place by a bandage.

On the eighth day, dressings are removed and the parts cleansed with a warm boric acid solution. The stay sutures are taken out and the dressing reapplied for three days, at the end of which time all dressings are removed and the graft smeared with sterile vaselin, or other ointment.

The question as to the amount of pressure exerted by the bandage has not been seriously considered. The manner in which the bandage is applied may be best described as "snug" —which is defined as compact, convenient and comfortable.

If the whole lid is involved in scar tissue, or if it is partially or wholly lost, the pedicled flap may be required to correct the deformity. The flap may be taken from the adjacent skin in any direction, but in general, the pedicled flap for the correction of the lower lid should be taken from above, and that for the upper lid from below. By this procedure, the pull, incident to the contraction, tends to hold the lid in contact with the globe rather than to draw away, with a resultant ectropion. A graft will take if it contains subcutaneous tissue, but in order to secure the best physiologic result, the flap should be made as thin as possible. Moreover, if the flap contains only the whole skin, the tendency to pucker at the base is diminished. This tendency can be further lessened, by freely undermining the skin around the base.

After the flap is cut, allowing about one-third for contraction, it should be adjusted, so that it will remain in its proper position without undue traction. No greater mistake can be made than to force the position of a graft by the use of sutures. Time must not be an element in the operation.

Many operations have been suggested for the correction of lid deformities, and in special cases great ingenuity has been shown in the selection of flaps. Valuable suggestions are found in Spaeth's book on Ophthalmic Plastic Surgery and in articles by Wheeler.

Symblepharon. Because of the seriousness of this condition, every effort should be made at the time of the accident (it is almost always traumatic or chemical in origin), to prevent the formation of adhesions. One fruitful means of prevention would be to have all shop cases treated by oculists, instead of shop nurses, or others unskilled in the management of this class of cases.

The surgical management of symblepharon is often very unsatisfactory in spite of our best efforts. The use of whole mucous grafts is frequently advocated, but they are difficult to manage. Mucous membrane grafts taken from animals are not satisfactory. I have attempted to graft the conjunctiva from rabbits to humans with no success. The conjunctiva from humans, however, can be utilized for conjunctival repair. As only small

mucous membrane grafts are procurable, it is sometimes necessary to use the superficial layers of the skin. When this procedure is followed, there may be a troublesome exfoliation, but the inconvenience to the patient is nothing compared to the symptoms incident to the presence of a symblepharon. Epithelial grafts may be used on a mold, and, as far as I know, Dr. Wilder was the first in this country to suggest this method of their application.

If the syblepharon is extensive, a disc thru which a hole has been cut to protect the cornea, can be covered with an epidermic graft and inserted over the globe, after the lids have been dissected free. I have used a disc made from a mixture of wax and paraffin in equal parts. These ingredients are melted and allowed to cool, when a mold can be made of proper size. It never becomes very hard, and consequently is less prone to injure the cornea than dental material, or other hard substances.

Cul-de-sac Restorations. The essentials in this operation may be described as follows: A thin lid, extensive dissection, extending outward to the orbital margin at the angles, to the orbital margin below, and nearly to the orbital margin above, removal of all scar tissue, and a well fitting mold. Whether or not the periosteum at the angle should be incised, I am not certain.

The lid should be incised inside the hair line, care being taken to keep it thin, and of the same thickness thruout the entire length. The dissection at the canthi should go beyond the orbital margin. The position of the inferior punctum must be given special attention and care exercised not to injure the canaliculus. The inner portion of the lid may have the appearance of a slight undercorrection, after the mold is in place. In special cases, I have found when the palpebral fissure is small or a large mold required, that the insertion of the mold is greatly facilitated by incising the outer canthus. Usually no repair of the outer canthus is necessary. It takes care of itself. The importance of the removal of all scar tissue cannot be overstated; it is essential for success.

After the dissection of the lid is completed, a mold is made of dental material. A convenient way of estimating the approximate size of the mold is by using a fixation forceps as a pair of calipers. Separate the forceps by pressing the finger between the blades. Measure the maximum distance from the upper to the lower orbital margin. Mark this on the mold by drawing the forceps over its surface. Repeat the same procedure for the horizontal measurement, marking the mold at right angles to the vertical measurement. This will result in a rectangular figure, that will enable one to quickly cut a mold of approximate size. The mold required is usually of smaller size than one would expect, and I am sure you all have had the experience of beginning with one much too large.

It is not necessary to make the mold more than 3 or 4 mm. thick. The edges should be tapered off and a thin graft carefully applied. If only one sac is being restored, an incision may be made in the graft, about 5 or 6 mm. from the lid margin that is being restored, and the graft turned out over the lid margin. By this means, granulation of the small uncovered areas on the lid margin may be avoided.

The mold should be so fitted, that the lid closes easily and completely over it. The lids are held together by the use of a mattress suture, introduced thru the skin of the lids, 3 or 4 mm. from the lid margin.

The dressings are left in place eight days. If at the end of this time there are no complications, the skin sutures are removed, the discharge washed away and the bandage reapplied for two days longer. Then the dressings are removed and the orbit is washed out daily. The exfoliating epithelium can be removed by the use of alcohol on a cotton pledget. The amount of discharge present at the time of the first operation, seems to depend on the amount of normal mucous membrane

left in the orbit. The more radical the operation the less the discharge.

I have had no experience with the use of pedicled flaps for the cul-de-sac restorations. In my hands better results are obtained by the use of epidermic, than by whole skin grafts after the method suggested by Weeks. I have also had no experience with tubulated grafts, and not enough with bone grafts to justify any suggestion as to their use.

GLASS BALL IMPLANTATIONS: For several years I have followed the suggestion of Lancaster, of omitting the suturing of the muscles over the glass ball. I am of the opinion that average results are fully as satisfactory, if not better, than they were before this procedure was followed.

CONJUNCTIVOPLASTY IN CORNEAL ULCER.

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A woman of 58, poorly nourished, had suffered recurring attacks of corneal ulceration in her right eye. A year later she returned for an ulcer in the left eye which, in spite of treatment, extended concentric with the limbus until only one-quarter of the circumference remained free. Conjunctival flaps from above and below the cornea were brought together, but freed in a week. They retracted leaving a clear pupil. Under treatment of her general condition healing became complete with remaining regular astigmatism. Read before the Pacific Coast Oto-Ophthalmological Socity, April 1926.

The case which I wish to present will serve, I hope, as a means of bringing to your attention the value of conjunctivoplasty in progressive types of corneal ulceration. That it was combined, as it should have been, with internal treatment, the nature of which will be discussed later, in no way detracts from its usefulness.

CASE: The patient, whose left eye serves as the basis of this report, was a Scotch woman, 58 years of age, married and the mother of two grown sons. She was thin, spare, enjoyed poor health and hoped for the worst. She was absolutely devoid of a sense of humor and chronically underfed from choice. This element of undernourishment undoubtedly was a large factor in the development of the severe ulceration of her left cornea, which very nearly destroyed this entire membrane.

In August, 1924, the patient consulted me, complaining of a scratchy feeling in the right eye. Examination of the eye revealed a localized area of pericorneal injection to the nasal side of the cornea. Just at the limbus there was a small round ulcer which stained with fluorescein. Ointments containing holocain and mercurophen, holocain and novoform, were used, alternating with a 2% solution of mercurochrome and a zinc and boric lotion. The ulceration finally healed, altho it took a month to do so.

One month later she had another attack, in the same eye and of the same character; this healed promptly with the same medication as used in the first attack. After the lapse of a year, during which time she was free from any ulcers, she returned with quite a large one on the left cornea. One week previously she had what she described as an acute sore throat. Since then both eyes had been uncomfortable, but the left eye only showed ulceration.

The ulcer was about 4 mm. long by 1 mm. wide, concentric with the limbus, extending from nine to eleven o'clock. It was yellow gray in color and for a time showed no tendency either to spread or heal. Scrapings from it failed to show any distinctive organisms. Pericorneal injection was localized and at this time there was no iritis, altho this developed later. At first the ulcer was treated with holocain, mercurophen and zinc, which made no impression on it. Applications of 2% mercurochrome and iodin were made to the base after curetting away the slough. Pasteurization after the method of Prince and the use of the thermophore, both seemed rather

to irritate than allay the subjective symptoms, and certainly failed to check the ulcer's spread. Milk injections were also used.

At this time it became evident, that what at first seemed to be but a mild form of ulceration, was indeed formidable, and was spreading slowly but surely. Fortunately the extension was concentric with the limbus, at no time showing any tendency to advance over the pupillary area. In fifteen days, however, the ulcer had spread from its original position, between nine and eleven, so that it came to occupy that portion of the circumference of the cornea which lay between five and two o'clock leaving but a quarter of the circumference of this membrane free, between two and five. Thruout its course it was concentric with the limbus and varied in width from 1 to 3 mm.; opposite one o'clock it measured nearly 4 mm. in width.

Under cocain anesthesia the ulcer was curetted, and over the base and beneath the edges, the flat end of a tooth pick saturated in 50% trichloracetic acid was passed. This, too, failed to check its progress. Fearing to wait any longer a conjunctivoplasty was decided upon and performed under ether.

A flap of conjunctiva was dissected from above the cornea and one from below; and they were drawn over the cornea in such a manner as to leave a small, shuttle like, clear space, in the center of this membrane, with its long axis between ten and four. The two stitches placed at the limbus were at these points. Both eyes were bandaged three days. After this the unoperated eye was uncovered.

The lower stitch, that opposite four o'clock, gave way several days later, and the upper one was removed in a week. The lower flap of conjunctiva gradually receded to its original position, leaving the underlying cornea smooth and healthy. In this portion of the cornea the ulcer had not burrowed very deeply into the substantia propria, and altho Bowman's membrane was destroyed and the defect was filled in with scar tissue, the resulting scar was much less dense than one would have expected.

Unlike the lower flap of conjunctiva the upper one remained in position over the cornea, and failed to retract completely to its original position. That portion which remained filled in the upper limb of the ulcer, and formed part of the ultimate cicatrix. However, there was enough recession to ensure a free pupillary area.

Fortunately the patient has a slight, bilateral ptosis, which covers the scar and from a cosmetic standpoint leaves little to be desired. Of course the cicatricial contraction has left a rather high myopic astigmatism, but since the pupillary area was not attacked by the ulceration it is regular, and with correction the patient's vision is 20/30.

At the time I was treating this patient for corneal ulceration she was under the care of Dr. Paul Cooper of Portland, who kindly furnished me with the following data concerning her general physical condition.

Patient was emaciated, due to lack of the proper kind and quantity of food. Blood pressure systolic 90, diastolic 68. Heart and lungs normal. General gastroenteroptosis. Uterus and adnexae normal. Chronic constipation from spastic colitis. Urine normal. Blood examination: Reds, 3,900,000, whites 12,000, polynuclears 80%, lymphocytes 20. Teeth normal.

Dr. Kistner reported the nose and throat free from any acute or chronic infection at this time. However, about one year ago he removed her tonsils and washed out one antrum.

The general treatment of the patient, which was under Dr. Cooper's supervision, consisted of rest in bed, forced feeding, mineral oil and flaxseed for her constipation, iron and arsenic intravenously and calcium lactate, grains five, and parathyroid, grains one-tenth, three times a day. The use of calcium lactate and parathyroid was suggested by Dr. Cooper, who has had surprisingly good results with these drugs in treatment of chronic leg ulcers.

There was very little loss of corneal tissue and very slight scarring when

the healing of the ulcer took place. Since this was characteristic of the healing process in the series of leg ulcers treated by Dr. Cooper, it seems to me to be more than a coincidence.

The technic of conjunctivoplasty presents no particular difficulties, and is familiar to you all. Care should be taken to make the flap or flaps large enough, so that there shall be the minimum amount of traction on the suture.

Conjunctivoplasty certainly proved of immeasurable value in this case. I am convinced that had I not used it the patient in all probability would have lost her eye.

Just what role the calcium lactate and parathyroid played in promoting resolution I am not prepared to say, but I believe they were valuable aids and should be used early in similar cases.

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TRAUMATIC LESIONS OF THE OPTIC PATHWAYS. WITH REPORT OF A CASE.

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Accurate visual fields show lesions of the optic pathways, otherwise overlooked, after fracture of the skull. Their localizing significance is discussed. A man after a fall was unconscious for four hours. With consciousness blindness to the right and dimness of objects to the left was noticed. The latter cleared up, but right homonymous hemianopsia, slightly incomplete, remained: and the left fields were distinctly contracted. Pupil reflexes were normal. Direct injury, or pressure from hemorrhage on the occipital cortex, was the supposed cause of symptoms.

Involvement of the optic pathways following injuries to the skull will be found more frequently than expected if careful fields of vision are made, including the use of the tangent curtain for mapping scotomata and blind spots. Such injuries are usually attended with a concussion of the brain, altho the symptoms of concussion may be very slight. The patient, as a rule, will not draw the attention of the attending physician to such defects, because of the overlapping of the fields of vision which compensates, in most places, for the defects. Such involvement may be either immediate, due to direct injury by bone or hemorrhage, or late, due to a secondary hemorrhage, such as is seen in the late apoplexies affecting other structures of the brain, including also the nuclei of the third, fourth and sixth nerves. These late hemorrhages do not involve the tract as a rule. The occipital cortex, the optic radiations, the posterior limb of the internal capsule, or the external geniculate bodies are usually the site of such hemorrhages.

In basilar fractures, involving the the sella turcica, a bitemporal hemianopsia may result, complete or incomplete. If the whole chiasm is involved complete blindness will result. Combinations are also possible, such as one optic nerve and the middle of the chiasm, or the chiasm and one of the tracts. An aneurism of the internal carotid artery, resulting from the accident, may cause pressure on the lateral aspect of the chiasm and cause a nasal hemianopsia which may be unilateral. Altho the bilateral hemianopsia may not be equal in the two eyes, it will usually be found to be symmetric. Varying degrees of this hemianopsia may be seen, and according to Pireon[1] the following forms can be distinguished:

1. Hemiachromatopsia (colors).
2. Hemiastereopsia (form and size).
3. Complete hemianopsia.

The restoration of such involved fields occurs in a sequence which is the reverse of the above. All scotomata resulting from chiasm lesions, are at some time continuous with the blind spot, which is almost always incorporated in temporal field defects of either form or color. The presence or the absence of color field defects is important.

Complete bilateral blindness may result from chiasm lesions in a basilar fracture, running thru the sella turcica and sphenoid bone, which involves the whole chiasm. The x-ray will usually demonstrate such a large fracture.

Recently Lutz[2] has argued that monocular hemianopsia may occur, as a result of a lesion of any part of the optic tract from the lamina cribrosa to the calcarine fissure. This lesion rarely may be in the intraorbital part of the nerve, or in the radiation of Gratiolet, but it is usually near the chiasm. It may be the remains of a binocular or monocular amaurosis, or of a bitemporal or homonymous hemianopsia. Usually the lesion is extracerebral. It is explained by the fact that the crossed and uncrossed nerve fibers form separate bundles, and terminate in different cellular layers of the external geniculate bodies and the visual cortex. This monocular hemianopsia may be permanent or transitory, and is a late symptom.

Involvement of a tract gives a homonymous hemianopsia, usually complete, on the side opposite to the lesion. The pupillary reflexes are usually unaltered with the ordinary examinations, but the hemiopic phenomenon may be found, with difficulty, on careful examination in such lesions. Incomplete homonymous scotomata or sector defects may also be found. In such cases superior defects are much less frequent than inferior defects. The visual fields are gradually restored from the center towards the periphery when recovery occurs, and white objects are the first to be recognized.

All hemianopic fields are symmetric to some degree. In most cases of hemianopsia the fixation point escapes, due probably to the widespread representation of the macula in the occipital lobe of the same side, owing to the spread of the fibers of the papillomacular bundle and of the corresponding neurons of the third order, and also due to the bilateral representation of each macula in each occipital lobe. Altho this is true of lesions subcortical in nature, in tract lesions the fixation may also be involved. Associated symptoms seen in connection with tract lesions are occasionally a contralateral third nerve palsy and ipsolateral hemiplegia. The proximity of the cerebral crus, third nerve and other cranial nerves, also aid in making the diagnosis of a tract lesion. Where the external geniculate body is involved, which is extremely rare in the lesions under discussion, a homonymous hemianopsia will also be found usually, however, of a quadrant type. Involvement of the other primary optic ganglia, namely, the superior corpora quadrigemina and the pulvinar, do not, as a rule, cause a hemianopsia, if the lesion is limited to them.

Subcortical lesions are in the majority of cases the cause for hemianopsia. Falls on the back of the head or blows are the usual injuries. Fractures of the skull are not necessary to produce such conditions. Because of the marked spreading of the fibers of the optic tracts after leaving the ganglia and traversing the most posterior portion of the posterior limb of the posterior capsule, lesions in this region rarely cause complete hemianopsia but only quadrant hemianopsia or, occasionally, symmetric scotomata. There is no hemiopic pupillary phenomenon present in such cases, since the reflex fibers have left the tracts at the corpora quadrigemina. Accordingly, on a theoretic basis, in such lesions normal pupillary reflexes are obtained, but occasionally such cases will show some change in the reflexes.

Occipital lobe injuries will also cause a homonymous hemianopsia with symptoms such as are seen in subcortical lesions. Occasionally a double occipital lobe injury may occur, causing a double hemianopsia with, however, macular preservation in some rare cases. Total blindness may also occur with normal pupillary reflexes. Certain other symptoms may be associated, such as hemiplegia, hemianesthesia or deafness. Such conditions usually appear immediately following the accident and the prognosis is very grave. The pathology in such cases is usually hemorrhagic foci with a soften-

ing of the brain tissue and, rarely, direct destruction by bone.

Transitory cortical conditions, unilateral or bilateral, may also occur with or without complete recovery. It should be remembered that, because of the bilateral innervation of the macula, preservation of central visual acuity is possible, even tho one macular area may be destroyed. In all these cortical lesions, unless the lesion is bilateral, the early more or less complete blindness gradually becomes either a hemianopsia, or a complete restoration without any field defects. The initial total blindness is due to the reactive edema, the meningeal or cortical blood clots and the capillary hemorrhages. The common accompanying symptoms are headache and vertigo; and occasionally, migrain headaches, hallucinations, scintillating scotomata, etc. may be seen, resulting from the irritation.

According to Lister, when the lesion is over the occipital cortex of only one side the result is a hemianopic homonymous quadrantic defect on the opposite side; and where both lobes are involved at first complete blindness occurs clearing, gradually, centripetally in several days, after an interval of hours to days, giving rise to a more or less complete central scotoma with a full peripheral field. In others, one may get hemianopsia with partial homonymous quadrantic defects on the opposite side, combined with a central scotoma or a central scotoma with a tendency to hemianopsia. In such occipital injuries, according to G. Riccoch[3], the first returning visual impulse is movement beginning in the periphery of the field. The recognition of objects comes later.

Hemianopic scotoma may be macular, perimacular, quadrantic or perimacular, but they are always homonymous, are comparable in form and unmodified by time. Occasionally patients are seen who give the history of transitory attacks of hemianopsia but on examination none is found. Such attacks must be attributed to some local anginal spasm. In other patients a restriction of the fields may be seen, associated with blepharospasm and a convergence spasm, following very often a very slight injury. These cases must be relegated to the function group. Such a case was recently reported by L. Paton[4].

The combination of a homonymous hemianopsia with a marked concentric contraction of the remaining portions of the field, usually signifies a superadded functional element.

Attacks of blurring on changes of position are seen quite frequently following head injuries. This condition, however, must be considered purely of functional origin, altho a vascular lesion involving the vessels supplying the occipital lobe may be the underlying factor. In the same class of symptoms are the micropsia and macropsia sometimes observed as transitory conditions following skull injuries. Periodic visual obscurations, when associated with visual hallucinations, always in one field, are usually indicative of an area of softening in the parietooccipital regions, altho the visual fields will rarely show any changes.

During the past few years several patients with traumatic homonymous hemianopsias, usually incomplete, have been seen, following skull injuries of one type or another. The following is a report of one such case.

CASE—J. D., male, 45 years old, married, has a completely negative previous history. He has always been healthy and prides himself upon the fact that he has never had to consult a physician.

His family history is entirely negative. He has three children who are all healthy, and there have never been any miscarriages in the family.

He is a moderate smoker, consuming five to ten cigarets daily and occasionally he will drink whisky, but at no time has he drunk more than a few glasses at one sitting. All venereals are denied.

On December 16th, 1923, the patient fell down an elevator shaft from the second story of a building and landed on the posterior part of his chest and hit the back of his head rather severely. He was unconscious for four hours

following this and he was then taken to the hospital, where he remained twenty-five days. At the hospital the diagnosis of fracture of the base of the skull was tentatively made, altho there were no objective evidences of such. There was no bleeding from the ears or other orifices and no subconjunctival hemorrhages or hematomata of the lids. The x-rays, taken several times and in various positions, were all negative. There was a superficial laceration in the occipital region, which healed very readily without suturing.

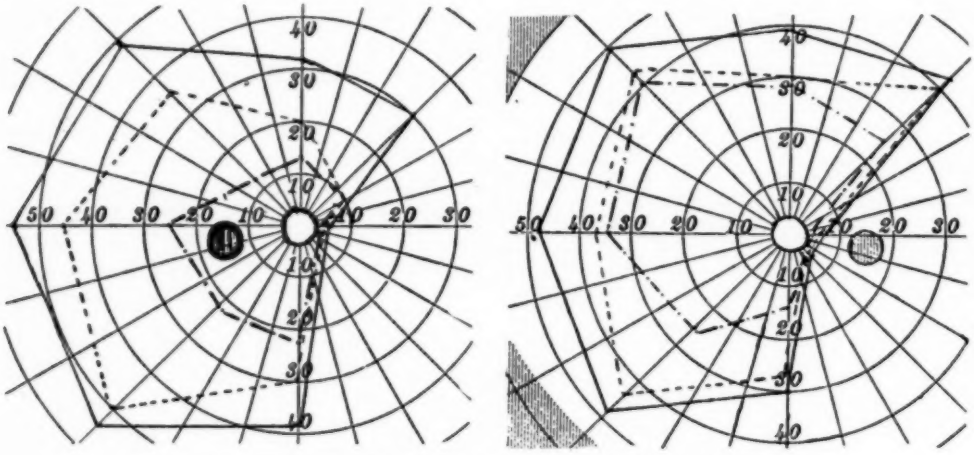

Fig. 1. Fields of vision June 16, 1924, showing right hemianopsia.

Six hours after regaining consciousness, the patient noticed that he could not see objects to the right of him, and also a dimness of all objects to the left side. The dimness of vision on the left side cleared up gradually within a period of two weeks following the accident, so that at the end of that time no dimness or defective vision on this side was noticed. The complete loss of vision to the right has remained, however, and has not cleared up in any way, nor has it become worse. The patient has noticed no diminution of vision looking straight ahead, and at the present time is doing his usual work without any disability. The patient has no other symptoms referable to the injury.

Examination. The patient is a well nourished man who does not look ill and who has a tendency to keep his head rotated slightly to the right. There is a faint linear scar present over the occipital region which is about one inch long and which is not tender, and is nonadherent to the underlying structures. The underlying bone is apparently normal. There is no evidence of any indentation, or bone loss. The general physical examination is entirely negative, including also the examination performed by a neurologist.

The lids, lacrimal apparatus, conjunctiva, cornea, anterior chamber, iris, media and fundus are normal in both eyes. The pupils measure three mm. in diameter in a medium light, are regular and react entirely well to both light and accommodation. The consensual reaction is normal. The pupillary reflexes were examined a great many times by the usual methods, in a moderate light and in a dark room; but at no time was any evidence found of a hemiopic phenomenon. The corneal slitlamp microscope was also unsuccessfully used for determining the presence of this phenomenon.

The ocular movements were found to be normal. There was no lagging with the excusion test in any field. There was an esophoria of two centrads for distance and exophoria of four centrads for near, and a near point of convergence of eighty-five mm. There was no diplopia obtainable on the tangent curtain in any of the fields.

The fields of vision, however, showed a characteristic right homonymous hemianopsia which was slightly incomplete, since the upper quadrants of the right fields were fairly well retained in both eyes. In addition there was noted a distinct contraction of the left field in both eyes, more marked in the left eye (See accompanying perimetric charts). On the tangent curtain no further changes were noted, the blind spot in the left eye being of normal size, while that in the right eye was absent, being included in the deficient field, and there were no paracentral scotomata.

The vision in either eye was 20/20 without any correction, and with a plus 1.25 sphere over either eye the patient read J.1. The accommodation in either eye, as measured with the Duane rule, was 3.5 diopters, and together it was 4 diopters.

The blood pressure was 130/70. The urine examination showed no evidence of any pathology in the kidneys. The blood Wassermann was negative.

To SUMMARIZE. This patient had a very severe skull injury, following which an absolute right homonymous hemianopsia developed with a relative left homonymous hemianopsia. The pupillary reflexes are normal and central visual acuity is undisturbed. The hemianopic pupillary reflex of Wernicke is not obtainable in spite of the many attempts made and the various methods used.

The absence of any arteriosclerotic changes, the negative Wassermann reaction and the negative urine, with the almost sudden onset following injury certainly puts the lesion into the traumatic group.

The exact location is also of importance. It is inconceivable that a fracture of the base would cause involvement of practically both tracts with later clearing up of one tract, except in the region of the sella turcica, and such a fracture would be easily demonstrable by x-rays. X-rays in this case have been, however, constantly negative. Furthermore there has been no evidence of a hemianopic reflex, and it is unusual for a tract lesion to clear up as completely as the right tract did in this case.

The presence of the pupillary reflexes, the incomplete hemianopsia as shown by the quadrant remaining in the upper field, and the concentric contraction of the remaining fields would tend, in my opinion, to put this lesion in the occipital cortex with involvement of both visual areas. The very excellent central visual acuity also tends to support this diagnosis. The site of the original trauma was also in the occipital region and a direct brain injury would thus be possible. Recovery of the fields on one side would indicate that primarily there had been a hemorrhage compressing one occipital lobe, which had gradually become absorbed. Real brain injury had only been done to the left occipital lobe. It is interesting to note, however, that no visual hallucinations have occurred in the hemianopic field and there are no headaches, vertigo, or other symptoms usually seen following such injuries.

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PANOPHTHALMITIS, EVISCERATION, SYMPATHETIC OPHTHALMIA.

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Panophthalmitis after perforating injury was treated by evisceration. Twenty days later the other eye showed evidence of sympathetic ophthalmia. The stump was enucleated. Under sodium salicylate vision gradually rose until it was 20/15. Read before the St. Louis Ophthalmic Society, October 22nd, 1926.

The cause and nature of sympathetic ophthalmia are still unknown and its treatment is still chiefly empirical. Nevertheless in groping for some helpful remedy, or in pursuing some theory, or in following rational methods of treatment used in other diseases, certain helpful agents have come into use that greatly increase our chances of success when we have to face the disease. It is not a very familiar disease and appears in various forms and under various circumstances and any of us may be confronted with it at any time. There are some features common to a majority of cases and some cases are reported in which a conclusive diagnosis is not established. The case with which this paper is particularly concerned has some common features and some unusual ones. One of the common features is a penetrating wound, altho cases have been reported following intraocular sarcomata and subconjunctival ruptures of the choroid.

This man, age 31, weight 150 pounds and of strong physique, was struck in the left eye July 27, 1926, by a 10-penny nail, which he pulled out himself. He was treated for 11 days by Dr. C. W. Brown of Campbell, Mo., who then referred him to my senior associate, Dr. A. E. Ewing. Dr. Ewing was on his vacation and the case was taken charge of by me. There was a large penetrating wound in the ciliary region on the nasal side from which pus was exuding. There was a yellow reflex from the vitreous, much chemosis, exophthalmos and swelling of the lids. Vision right eye 20/15, left eye doubtful perception of light. He was put into the hospital where the eye was treated, with 2% mercurochrome night and morning, with atropin and irrigations every two hours.

The panophthalmitis instead of progressively destroying the interior of the eye partly subsided and the eye became quieter but still caused much pain. Aspirin grains five was being given every three hours, and on one or two occasions morphin became necessary at night. This treatment was kept up for four days, it now being 15 days since the injury. Some cases of death from meningitis have been reported following enucleation in cases of panophthalmitis and panophthalmitis has generally been considered good prophylaxis against sympathetic ophthalmia. In fact, as recited by Dr. Harold Gifford in his chapter on Sympathetic Ophthalmia in the American Encyclopedia of Ophthalmology, one of the earliest measures used was induction of panophthalmitis, in the eyes of horses, to prevent destruction of the other eye from sympathetic disease. Accordingly evisceration was advised and accepted.

Under gas anesthesia the cornea was cut away and the contents of the globe were scooped out. The lens was clear, but had behind it masses of brownish yellow material and some firm uveal tissue, which indicated that probably the panophthalmitis was incomplete. This was disturbing, and a very thoro curetting of the interior of the globe was done, in the hope of evacuating all the uveal tissue. Pain promptly subsided; and four days later, August 15, patient left the hospital and reported daily at the office. The eviscerated globe gradually shrunk, without pain or purulent discharge.

The vision of the right eye constantly held at 20/15. He read 3½ point type at 23 cms. without glasses. The ophthalmoscope showed a number of old choroidal atrophic areas in the extreme periphery of the fundus, espe-

cially below. The only history we could obtain that might account for this was, an attack of typhoid fever at age of 11 and a second very severe attack 3 years ago. The presence of these, however, indicated the need of unusual caution. August 29 the patient particularly wished to return to his family in a distant town but the shrinking of the left globe was not completed and he was not permitted to do so.

September 1, twenty days after the evisceration, he complained of slight blurring. His visual acuity was found to fluctuate from 20/19 to 20/38 but he could read 3½ point type at 23 cms. This caused apprehension altho there were no definite inflammatory symptoms. Next day there was a slight diffuse flushing of the globe especially in bright light. The eye was plainly a sensitive eye with the vision still down somewhat. There were no deposits on Descemet's membrane, as seen with the ophthalmoscope, or a Coddington lens in strong oblique light, or the slit lamp. The slit lamp also failed to show any increase in the cellular contents of the aqueous. The slit lamp observations were made by Dr. L. T. Post. All symptoms thus pointed to sympathetic irritation rather than sympathetic ophthalmia.

Fearing sympathetic ophthalmia, however, enucleation of the shrunken globe was advised and accepted. This was done under gas anesthesia that afternoon. The globe was adherent to surrounding tissues at every point and was dissected out with difficulty. It was turned over to Dr. Harvey G. Lamb for pathologic examination. During the next two days, September 3 and 4, the general redness of the globe increased but there was no iritis, the pupil dilated widely in dim light and contracted promptly in bright light. On the morning of September 5 this condition still held, but by afternoon the pupil had become sluggish and slightly irregular in outline. There was a tendency to adhesion in the upper nasal quadrant. This definitely declared the condition as sympathetic ophthalmia.

Atropin-cocain instillations every three hours were instituted. Sodium salicylate grains ten t.i.d. had been administered since enucleation. This was increased to grains thirty t.i.d. and a full dose 0.6 gram of neosalvarsan ordered. This was administered without untoward result. During the next few days, deposits appeared on Descemet's membrane, the iritis increased and vision fell to 3/96. The patient became despondent and sent for his wife and three children that he might see them for the last time. September 14 pulse suddenly rose to 110 and two doses of sodium salicylate were omitted. Patient now perspired freely and complained of some pain about his heart. He was kept in bed practically all the time. The eye was gradually getting quieter. September 16 there was a rather sharp relapse, increased injection, photophobia and diminished pupil. Preparations were made to administer 30,000 units of diphtheria antitoxin; but patient's pulse had jumped to nearly 120 just before relapse and it was considered best to reduce sodium salicylate to grains ten and wait a day.

Next day the eye was much better and use of antitoxin was abandoned, sodium salicylate grains 30 t.i.d was resumed. From this time on the eye steadily improved. The pupil became dilated ad maximum, and a zone of fine pigment could be seen completely encircling the anterior capsule where the iris had drawn away from it. September 22 with +3.00 S. V. 10/30. September 25 sodium salicylate was reduced to gr. ten t.i.d. and on September 30 both it and the use of atropin were stopped. The pupil remained widely dilated and showed no reaction to light for six days, then began responding slightly. October 11 it was still 7½ mm. in diameter and very sluggish. Vision without glass was 20/30. There was still considerable keratitis punctata.

October 12 without glass vision 20/15, reads 3½ point type at 25 cm. Pupil normal in size, reacts readily to light and iris is nowhere adherent to lens. Lens clear. No floating par-

ticles in vitreous. Recovery appears to be complete. In this case the Wassermann was negative and no focal infections were discovered.

The use of atropin in such cases as this is evidently rational. Its chief effect is the mechanical withdrawal of the iris from the lens so that it will not adhere to it. There appears, however, according to the researches of Dr. Francis H. Adler, to be an additional factor of value. The permeability of vessel walls to protein molecules appears to be diminished with corresponding diminution in pathologic activity. As is well known Harold Gifford introduced the use of salicylates in sympathetic ophthalmia in 1899. Its method of operation is still unknown. Pharmacologists feel that it is a symptomatic drug in all branches of medicines, being used effectively for the relief of symptoms but that fundamentally its mode of action is an unsolved problem. After internal administration it can be found in nearly every secretion, fluid and organ in the body.

Its distribution in the eye has been investigated by S. R. Gifford and reported in the American Journal of Ophthalmology, 1922, 5, 948. The sodium salt was administered gastrically to rabbits and cats, one of whose eyes was infected and the other used as a control. It appeared in equal concentration in the infected and noninfected eyes. It appeared in the aqueous humor within 25 to 40 minutes after administration and was still found after 20 hours but not after 24 hours. It was found more abundant in the aqueous and vitreous than in the uvea or corneoscleral coat. In its use in sympathetic ophthalmia, in large doses, we can expect its action to begin promptly. There appeared an extensive review of the actions and uses of the salicylates in August, 1926, number of Medicine.

The use of salvarsan or neosalvarsan was introduced, according to H. Gifford, by Jones and Browning in 1911 on the theory that the disease had certain characteristics that showed it might be protozoal in origin. Since then other observers have used it with apparent good results. At the last meeting of the American Ophthalmological Society Verhoeff reported good results in seven cases treated by large doses of diphtheria antitoxin.

In the above case it cannot be definitely concluded that the attack of sympathetic ophthalmia came as a result of the insufficiency of the evisceration. The evisceration was done 15 days after the injury and cases have been reported following enucleation done earlier than that. Generally in the absence of panophthalmitis, enucleation is considered somewhat safer than evisceration.

Pathologic Report by Dr. Harvey G. Lamb. The ocular sac remaining after the evisceration is made up mostly of thickened sclera, but contains anteriorly a narrow rim of thickened cornea. It would appear that after excision of the cornea, the small remaining portion of the cornea and the entire sclera contracted posteriorly to a marked degree, at the same time thickening irregularly for from 3 to 6 times the normal thickness. The corneal rim is much thicker than the sclera just posterior to it.

The corneal tissue rim is lined anteriorly by anterior epithelium which on one side has grown posteriorly along the incised surface but separated from it in almost its entire extent by a folded and wrinkled extension anteriorly of Descemet's membrane. On the opposite side, Descemet's membrane, in a much wrinkled and folded condition, lines the posterior surface of the cornea. The corneal corpuscles in the substantia propria show much proliferation and in many places many capillaries. A small amount of diffusely scattered polymorphonuclear leucocytes are seen in the substantia propria. The incised edge lined with a continuation of anterior epithelium shows little inflammatory reaction in the substantia propria just adjacent. On the opposite side there is seen much newformation of fibroblasts from the corneal corpuscles, interspersed with polymorphonuclear leu-

cocytes and large mononuclear leucocytes, near the incised surface.

The anterior portion of the ocular sac is occupied by organizing fibrinocellular exudate. On one side anterior epithelium of the cornea extends posteriorly and externally from the wound edge for a long distance behind one part of this exudate. This organizing exudate contains much hemorrhage with plasma cells, young fibroblasts and new connective tissue fibers. In the central part of the sac there is only hemorrhage with a few scattered polymorphonuclear leucocytes and large monocuclear leucocytes. Posteriorly inflammatory cells increase in number with marked organization present. Great numbers of young fibroblasts and many capillaries are seen. Dense masses of small lymphocytes are seen posteriorly just adjoining the sclera, in the midst of which are epithelioid cells and an occasional giant cell; some of the epithelioid cells are pigmented.

The optic nerve behind the cribriform plate shows little change from the normal; anterior to the cribriform plate, the normal position of the papilla is occupied by inflammatory exudate. The central retinal bloodvessels extend as a straight stem far anteriorly into the inflammatory exudate.

The posterior emissary bloodvessels and nerves, lying in the inner two-thirds of the sclera, show dense coverings with small lymphocytes. In several places these lymphocytic coverings are continuous with the dense lymphocytic masses in the posterior part of the ocular sac.

Diagnosis: Sympathetic infiltration in inflammatory exudate in the extreme posterior part of the eye; possibly this infiltration came from the posterior emissary vessels and nerves after the evisceration.

Metropolitan Bldg.

NOTES, CASES, INSTRUMENTS

MODIFIED LAGRANGE OPERATION FOR GLAUCOMA.

JOEL WHITAKER, M.D.

MIAMI BEACH, FLORIDA.

For the past seven or eight years I have been doing a modified Lagrange when I thought a cicatricial scar was indicated. I conceived the idea of turning the conjunctival flap away from the cornea after twice accidentally puncturing a flap everted toward the cornea in another operation. In each instance I closed this accidental opening with a stitch and got an uneventful recovery.

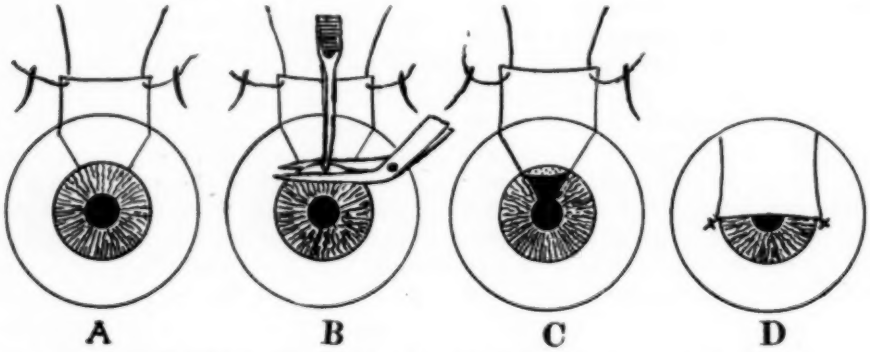

Fig. 1. A, Conjunctival incisions and flap. B, Cutting away corneal tip. C, Iridectomy. D, Operation completed. Flap sutured.

Make two incisions, beginning at the corneal attachment of the conjunctiva, on one side at about two and on the other at about ten o'clock, radiating well back toward the fornix, at least 6 or 8 mm. With curved scissors undermine the flap and free it from the cornea. Lift flap and pass needle and fine silk thread thru each side of the flap near the angle. These threads will aid in keeping flap everted.

With keratome preferably or with cataract knife make incision in sclera a millimeter or more back of the former corneoconjunctival attachment, or as far back as you dare go, the incision to lie entirely within the denuded surface and representing about one-fifth of the circumference. With rat tooth forceps grasp the incised corneal tip, evert it and remove an elliptical section with curved scissors. This section may remove as much of the cornea and be as large as necessary. Fortunately it is next to impossible to get other than beveled edges to this section. The conjunctival flap will adhere to these beveled edges readily.

Now do an iridectomy. Grasp the iris near its attachment and do a broad buttonhole iridotomy, tearing away as much of the attachment as desired, cutting thru the sphincter muscle and removing a section of the iris.

Cover this opening with the conjunctival flap by passing one needle and thread thru conjunctiva near cornea at about three o'clock and the other at about nine o'clock and tie tightly.

The conjunctiva will adhere to the denuded surface of the sclera and beveled edges of the cornea. The eye is dressed and bandaged in the usual way. The stitches should slough out in three or four days but may have to be removed especially when not tied tightly. After the healing there will remain no overhanging conjunctiva and a perfect covering of all of the denuded surfaces will result.

This method offers ample space for any form of iridectomy desired, either large or small corneoscleral opening which is completely covered with conjunctiva and has the advantage of cutting away from and not toward regions of danger.

Post Office Building.

FURUNCLE OF THE LACRIMAL CARUNCLE.

WM. H. CRISP, M.D.

DENVER.

Marin Amat of Madrid, Spain, has recently (Anales de Oftalmologia, 1926, January, p. 26) published a case of furuncle of the lacrimal caruncle. He remarks that this condition is very rare, and refers to the French Encyclopedia of Ophthalmology as mentioning case reports by only four authors. The subject is barely mentioned in the American Encyclopedia of Ophthalmology.

In January, 1918 (Amer. Jour. Ophth., 1918, v. 1, p. 344), I reported to the Colorado Ophthalmological Society the case of a young lady of twenty-one years who had had, at an interval of four months, an abscess or boil in first the right and then the left caruncle. I definitely reported the case as one of furuncle of each caruncle, but in the society's report the word shown was "abscess." In the second eye a firm core, or slough, of the size of a small pea was lifted out whole, with the Graefe cataract knife which I employed to incise the caruncle. The patient had no other severe ocular disturbance.

So far as I am aware, my case is the only one recorded in which this condition occurred in both eyes.

530 *Metropolitan Bldg.*

CONJUNCTIVITIS AND DERMATITIS DUE TO BUTYN.

ALBERT N. LEMOINE, M.D.

KANSAS CITY, MO.

Mrs. T. C., aged 50, was first seen August 29, 1925. At that time she was complaining of a "sensation of sand in both eyes." Her past history was essentially negative.

Clinically the patient was a hypothyroid. There was a slight follicular hypertrophy of the conjunctiva of the lids, and a general congestion of the conjunctiva. With +0.75 her vision was 20/20 in both eyes. The eyes were otherwise physiologic. Smears from conjunctival secretions revealed a few pus cells and a fair number of xerosis bacilli.

She was advised to discontinue her face powder, and was given a prescription of 1% butyn, and ¼% zinc sulphate, to use in each eye every three hours. She returned four days later apparently well, and was advised to discontinue the treatment and use only talcum powder.

March 22, 1926. Two days previous the eyes felt a little uncomfortable so she instilled a drop of the prescription given to her on the previous August—butyn and zinc—in each eye. Her eyes were getting much worse so she returned to the office for advice. At this time the lids were puffy and the skin of the lids and extending about an inch below and out on the face presented a brawny appearance. The conjunctiva was very red and swollen with follicles on the palpebral portion. The patient was given expectant treatment and she continued to use the drops at home. The condition was getting much worse. On March 24, 1926, the skin about the eyes was very dark and parched. There was profuse lacrimation and mucus discharge. The palpebral conjunctiva was markedly congested with many follicles. The bulbar conjunctiva was edematous and very red. The patient's eyes were so irritable and the photophobia so marked that she could scarcely open her eyes. Except for the parched skin it looked like a severe acute trachoma. Fields, intraocular tension, anterior chamber and fundus were all normal. Pupillary reflexes were normal. .02 cc. of a 1% solution of butyn was injected intradermally. Within a half hour, at the site of the injection, there was a wheal as large as a half dollar, with a large area of erythema around it, which persisted for two days. The area of the wheal became brown and later desquamated. She was advised to discontinue all medication and irrigate the eyes with normal saline every two hours. The eyes immediately improved. Four days later she was almost well.

March 28, 1926. A drop of 1% solution of butyn was instilled in each eye. Her eyes were swollen shut be-

fore she reached home. The next day on returning to the office her ocular condition was about the same as on March 24, 1926. She was put on saline irrigation and in four or five days the eyes were well again. To date she has had no further trouble with her eyes.

In searching thru the literature I have been unable to find any other cases reported which developed butyn irritation. No doubt had this patient been tested for hypersensitivity to the common proteins she would have been found hypersensitive to other substances, as is usual in these cases. It is very probable that she was sensitive to the powder she was using, as she has had no recurrence of her conjunctivitis since discontinuing it.

Rialto Bldg.

THE SHADOW TEST.

CLARA A. MARCH, M.D.

BUFFALO, NEW YORK.

Strange as it may seem, there are still some ophthalmologists who do not use the shadow test. Because the method is time consuming, and requires great care and painstaking observation, it is sometimes either omitted altogether, or delegated to some less skillful assistant. This is to be regretted because skiascopy, when properly done with complete cycloplegia, is by far the most accurate and scientific objective method of measuring the full error of refraction. Other methods being subjective and depending on the patient's answers to questions, which in turn depend on his powers of observation, are not always reliable, and should be used mainly as an adjunct to skiascopy.

It is pitifully easy in many cases to satisfy the patient. Some patients for some psychologic reason, are pleased to be told that their eyes are so "bad" that it will be necessary for them to return frequently for re-examination and a change of glasses. They come repeatedly, not knowing that their trouble may sometimes be due to a hurried refraction at the hands of an indifferent doctor who cares more about seeing a large number of cases than he does about the quality of his refraction work. After making all due allowance for the patients in whom it can not be used, still, a careful shadow test under cycloplegia is the foundation of a good refraction in the vast majority of cases. With some exceptions, such as progressive myopia or advancing presbyopia, these patients do not need to return often for another refraction.

Of course, because of the time it takes, it reduces the number of patients a doctor is able to see in the course of the day. This is perhaps one reason why the method is not more universally used. Another reason is, that some oculists have not taken the trouble to master it, and therefore fail to appreciate its value. Its use, however, more than repays one, because of the certainty of results, and the inward satisfaction one feels in work well done. As a doctor once remarked to me in the clinic where we were refracting, "The only reward we will ever receive for this kind of work is where moths and rust do not consume, and where thieves do not break in and steal."

465 Ashland Ave.

SOCIETY PROCEEDINGS

BALTIMORE MEDICAL SOCIETY.

Section of Ophthalmology.

October 28, 1926.

Dr. Wm. H. Wilmer, President.

Symposium on Tuberculosis of the Eye.

(1) Medical Aspects of Ocular Tuberculosis.

Dr. Louis Hamman first drew attention to the well known fact of the enormous distribution of tubercular infection involving upward of 95% of all adults. In the vast majority the infection remains quiet thruout life. In a few individuals, however, due to factors that are very incompletely known, there occurs occasionally some local manifestation of tubercular infection. Such a local manifestation may be in the eye, or in the pleura, or in the lungs, or skin or viscera, and the presence of such a lesion indicates the occasional dissemination of tubercle bacilli. There is a difference in the reaction of individuals to the localization in some part of their body of tubercle bacilli, depending on whether they have or have not, been previously infected with tuberculosis. The altered reaction of an infected individual affects not only his reaction to living tubercle bacilli, but also his reaction to dead bacilli and to certain of the products of dead bacilli. This is the basis of the tuberculin test and with certain well known exceptions the tuberculin test may be considered as conclusive evidence of the presence or absence of tubercular infection. Since, however, tubercular infection is so wide spread that a positive tuberculin reaction can be obtained in about 95% of normal adults, the presence of such a reaction cannot be taken as conclusive evidence that a particular ocular infection is tuberculous. Indeed, except in cases where the diagnosis can be made with certainty by the inspection of the ocular lesion alone, we are able to infer a tuberculous etiology in any particular case only by exclusion. The effect of treatment with injections of tuberculin adds a certain amount of presumptive evidence in favor of our conclusion.

Tuberculin can be used as a diagnostic aid in several different ways. (1) The von Pirquet test or the intradermal injection of a small amount of tuberculin. If such a test is negative, it can be asserted with certainty, having regard for certain well known exceptions, that the patient has no tuberculous infection. If the test is positive, we know with certainty that the patient has had a tuberculous infection and we may therefore be permitted to suspect that the ocular condition is of tuberculous etiology. (2) Large quantities of tuberculin can be injected subcutaneously. When this is done an acute inflammatory reaction develops about any tuberculous lesion in the body. Such a reaction in the eye may be considered as proof of the tuberculous etiology of the ocular trouble—but the use of this test is extremely dangerous for the reaction about the ocular lesion can not be controlled or limited, and while we may by this process arrive at a certain diagnosis, we are just as likely to permanently and seriously damage the patient's vision. This test is, therefore, not to be used in connection with ocular inflammatory lesions. (3) A modification of the method of No. 2 which is less dangerous and which may at times lead to equally conclusive results, consists in the injection, subcutaneously, of gradually increasing doses of tuberculin, beginning with a minute quantity insufficient to produce a focal reaction in the eye. When this is done and when the patient is observed repeatedly over a long period, it is sometimes possible to note a very slight focal reaction in the eye following one of the subcutaneous injections. Such a reaction, if it is not merely a coincidence, may be taken as evidence of tuberculous etiology of the ocular trouble and providing the dosage of tuberculin is increased slowly and with great caution, the danger of serious intraocular results can be avoided. (4) A further variation in the use of tuber-

culin represents a modification of method No. 1. This consists in testing the patient's reaction to various dilutions of tuberculin in order to discover the minimal dose with which a positive cutaneous reaction can be elicited. If it is found that the patient reacts markedly to the intradermal injections of extremely minute doses of tuberculin, the presumption that there is some activity in the tuberculous infection of the patient is strengthened and with some reservations we may feel a greater certainty that the ocular trouble is of tuberculous etiology. Too much significance should not, however, be attached to such a test for the parallelism between the degree of skin sensitivity and the degree of tuberculous activity is not an absolute one. The test, however, is of great use, especially in determining how one should begin tuberculin treatments, providing one had decided that tuberculin treatment is indicated.

The theoretic basis of the use of tuberculin injections in the treatment of focal tuberculous lesions rests upon the fact that the production of extremely mild inflammatory reactions about the tuberculous focus appears to stimulate the resistance of the body and to facilitate healing. The most rational procedure, therefore, appears to be to inject subcutaneously first the minimal dose which will produce an intradermal reaction. Following this, at regular intervals, increasing doses are to be given, careful observation being made all the while to discover whether any focal or general reactions are produced. With the exercise of reasonable judgment the focal reactions about the ocular lesions can be kept within the bound of safety. The speaker expressed the opinion that by such a course of treatments a certain number of cases were definitely benefited. It should, however, be remembered that with the exception of a relatively limited group of ocular affections, including phlyctenular disease and certain rare caseous lesions where the diagnosis could be made by mere inspection of the eye, the diagnosis of ocular tuberculosis was a presumptive one only. While this presumption is supported in some measure by the results of tuberculin treatment, it is a rather striking fact that the supposedly tuberculous lesions of the eye are notoriously rare among the patients known to have pulmonary tuberculosis. This is true not only of active ocular lesions among patients suffering from active pulmonary tuberculosis, but it was also true of the scars and characteristic residua of the intraocular affections which are presumed to be tuberculous. It is difficult to explain this absence of ocular trouble in patients known to have tuberculosis and this absence throws some doubt perhaps on the correctness of our assumptions of a tuberculous etiology for these conditions. This doubt does not include phlyctenular keratoconjunctivitis, for a history of such trouble is fairly frequently obtained from patients suffering with active pulmonary tuberculosis.

(2) Pathology of Ocular Tuberculosis.

Dr. Jonas S. Friedenwald stated that he feared that the results of his presentation would be unsatisfactory, for the pathologist had little to contribute toward settling the question of the tuberculous nature of those conditions which were of greatest clinical interest. Those cases in which the clinician was certain of tuberculous etiology—such as massive caseous lesions of the eye could be demonstrated by pathologic study to be in fact tuberculous. But those cases of choroiditis, iritis, and recurrent vitreous hemorrhages in which the clinician made the presumptive diagnosis of tuberculosis, could not with any certainty be demonstrated by pathologic examination to be tuberculous. Indeed, he felt that certain pathologic lesions such as perivascular infiltration in the retina which has by some pathologists been taken as pointing to a tuberculous process, appeared to him to be a perfectly nonspecific inflammatory reaction. While the patient deserved the benefit of the doubt, the pathologist must needs exercise great caution in the diagnosis of ocular tuberculosis.

(3) Clinical Bearings of Tuberculosis in Ophthalmology.

Dr. Wm. H. Wilmer after discussing the extensive recent literature on this subject, stated his impression that certain intraocular trouble, notable chronic forms of exudative choroiditis, and cases with recurrent vitreous hemorrhages were almost always caused by tuberculosis and were greatly benefited by tuberculin treatment. Syphilitic and focal infections must first be eliminated. If the condition then persisted and if the intradermal tuberculin reaction was positive, tuberculin treatment was given to his patients in the manner outlined by Dr. Hamman. Since pursuing this mode of treatment very striking therapeutic successes have been encountered. Indeed, Dr. Wilmer stated that he had had in recent years, no case of recurrent vitreous hemorrhage in which he had not been able to save at least some vision in one eye. The use of dionin and of hot compresses was recommended by Dr. Wilmer as an aid to the specific therapy.

The discussion was participated in by most of the members in the section. Practically all stated that they employed the therapeutic procedure outlined by Dr. Hamman and Dr. Wilmer. Some doubt, however, was expressed as to whether the clinical course of the cases was very different nowadays when tuberculin was used, from what it was in former years when with equal certainty all these conditions were regarded as syphilitic and when the treatment consisted in the indiscriminate use of mercury and iodides.

Jonas S. Friedenwald,
Secretary.

ST. LOUIS OPHTHALMIC SOCIETY.

October 22, 1926.

W. E. Shahan, President.

Sympathetic Ophthalmia Following Panophthalmitis.

This case, presented by Dr. W. E. Shahan, is published in full on page 120.

Discussion. Dr. N. R. Donnell said that the only case of sympathetic ophthalmia occurring in his practice was treated with large doses of salicylate only and recovered with useful vision. This was before the days of salvarsan.

Dr. J. H. Gross said that there are quite a number of cases on record, in which sympathetic ophthalmia has arisen several weeks—some as many as eight weeks—after the exciting eye has been enucleated. He thinks this bears on the question of the presence of uveal tissue in the exciting eye.

Dr. Wm. F. Hardy commended Dr. Shahan for his treatment of the patient from the beginning to end, and congratulated him on the outcome of the case. He feels that this report weakens to some extent, the hypotheses we have heretofore entertained regarding the etiology of sympathetic inflammation. One in particular has of late received considerable attention, namely, the presence of a focal infection somewhere in the body, which has been credited with originating the outburst of sympathetic inflammation. That Dr. Shahan did not find a focus of infection, does not absolutely disprove the existence of one; an occult one may have been present as evidenced by the presence of old areas of choroiditis. The fact that the patient had a panophthalmitis explodes one idea we have long entertained; viz.: that a panophthalmitis in an injured eye is a guarantee against the development of sympathetic ophthalmia. All the uveal tissue in this diseased eye had been destroyed he understood from the pathologic report of the microscopic findings.

Dr. Hardesty asked Dr. Shahan to what particular therapeutic agent he attributed his unusually good result.

Dr. E. C. Spitze spoke of a case he had which recovered under treatment with mercurial inunctions and sodium salicylate.

Dr. C. W. Tooker said that an interesting feature of the case presentation is the evidence of old choroidal trouble in the sympathizing eye. There has been quite a bit in the literature recently regarding the part played by various focal infections and general

diseases that damage the choroid and make it susceptible to sympathetic inflammation. It would be most interesting to know what disease process went on in this sympathizing eye before the injury to the fellow eye.

DR. W. E. SHAHAN in closing the discussion said that focal infections were sought for at various times during and previous to this attack, chiefly by the hospital internes, and none were found. There were no roentgen ray pictures taken. The patient had an attack of typhoid fever three years previous to the present disease, and some chronic focal infection may have been left and not discovered. Dr. Shahan could not assign the good result in this case to any one agent used. The atropin was, of course, vital. The salicylates probably came next and then the neosalvarsan.

Spontaneous Absorption of Mature Cataract.

Case reported by Dr. F. E. Woodruff.

Discussion. DR. W. E. SHAHAN said that last August a patient upon whom he had done a cataract extraction sixteen years ago came in complaining of having better vision in his formerly blind eye than in his good one. He had had a cataract of both eyes following an attack of ophthalmia electrica due to a flash from a 500 volt short circuit at the age of 45 years. A successful extraction had been done on his left eye and proper lenses prescribed. A balancing glass, +11.00 S. had been placed over the right eye, which had no useful vision. His vision was now found to be 20/20 right eye, and 20/20 left eye, with glasses prescribed in 1915. His complaint was inability to read with the right eye; the left lens having a reading addition which had been omitted from the right. The ophthalmoscope showed a clear circular pupil and normal fundus with a disorganized lens lying below the pupil. A reading addition to the correction of his right eye solved his trouble. If this patient had been following some cult, his spontaneous recovery of vision would have been heralded as a miracle. This was a case of partial absorption and dislocation of the remaining nucleus without inflammatory reaction.

Lantern slides of **Unusual Pathologic Material** were shown by Dr. C. W. Tooker.

DR. C. W. TOOKER,
Editor.

PITTSBURGH OPHTHALMOLOGICAL SOCIETY.

October 25, 1926.

DR. E. B. HECKEL, Presiding.

Penetrating Wound of Eyeball.

DR. EDW. STIEREN presented a double penetration of the globe with recovery of vision. On September 22, 1926, a piece of flying metal penetrated the left globe thru a wound 2 mm. long, between the insertion of the inferior and internal recti and 4 mm. from the limbus. Two hours later a magnet was applied to entrance wound without symptoms or results. This was followed by conjunctival suture. Fundus details were invisible owing to massive vitreous hemorrhage. Localization shows a 2x4 mm. intraorbital foreign body, 32 mm. behind center of cornea, 4 mm. below horizontal and 7 mm. to temporal side of vertical plane. Twenty-four hours later uveitis was evident and twelve hours later panophthalmitis with intense lid edema. A gloomy prognosis was given and huge doses of salicylates internally and saturated solution of dionin and atropin solution, locally, were administered. Later dionin powder was instilled once daily. After three days the edema receded and four days later dilatation of the pupil and disappearance of the edema and subsidence of the panophthalmitis resulted. The vitreous cleared until 33 days after the injury the vision was 6/15 and ocular congestion has disappeared. He hopes for further clearing under the continuance of the dionin.

Discussion. DR. C. F. BERNATZ suggests the subconjunctival injection of 10 to 15 minims solution of mercury cyanid (1-5000) early in all penetrating ocular wounds.

DR. E. B. HECKEL advises hands off until accurate localization and the early administration of 1500 units of

tetanus antitoxin for the dual role of a prophylactic and foreign protein. He suggests that too much optimism should not be felt in these cases as every eye containing a foreign body is potentially a lost eye, the eye being frequently lost later from uveitis and resultant phthisis bulbi.

DR. J. G. LINN cited a fatal case of pneumococcic meningitis following a penetration of the globe.

Unilateral Exophthalmos.

DR. W. E. CARSON presented a case in a male married adult. The history was that twenty-six days previously, after an alcoholic debauch, the patient awoke with a proptosed right eye. Examination of right eye shows exophthalmos of marked degree with limitation of adduction and elevation abolished. Compression of the globe results in no retrogression. A firm stationary mass is felt in the upper inner orbital quadrant. Roentgen ray of the orbit and sinuses is negative. Wassermann blood test is positive++++ Fundus shows a papillitis without definite elevation. Immediate treatment with saturated solution of potassium iodid was started internally. Time interval has not been great enough as yet to expect therapeutic results.

Discussion. DR. STANLEY SMITH suggests the mixed treatment as best for this stage of syphilis, assuming this to be luetic.

DR. C. F. BERNATZ advised differential blood count and the elimination of focal infection.

DR. EDW. STIEREN believes that the nature of motion limitation fixes the location of the growth in the upper and inner orbit, which is the most prevalent location for orbital syphilis.

DR. J. G. LINN thinks that malignancy of the adjoining sinuses should be eliminated and cited a similar case due to spindle cell sarcoma of the ethmoids, for which the growth was removed and exenteration of the orbit done, but with a fatal termination.

DR. E. B. HECKEL stated that in all cases of malignancy of the orbit requiring exenteration he used the cautery and advised it as the method of choice, with or without pre- or postoperative radiation, the nature and the extent of the growth determining the use of radiation and the time advocated. He suggested that the cautery limits hemorrhage and prevents the spread thru lymphatics and vessels, especially when the initial punctures are made in sound tissue.

Bilateral Exophthalmos.

DR. W. E. CARSON reported a case in a two day old infant, following a normal noninstrumental labor. Roentgen ray of the skull was negative except for slight overlapping of the bones at the superior fontanell. The exophthalmos subsided slightly after three days and at the age of eleven days was stationary.

Nuclear Palsy.

DR. E. B. HECKEL reports a case following encephalitis. Mrs. C. O., aged 30, seen in April, 1924, gave a history of encephalitis in 1918. Examination shows: Vision 20/20 in each eye and pupils and reactions normal. There is a slight drooping of left upper lid. The patient states that at times there is diplopia. Cycloplegic refraction shows a latent hyperopia of ¾ diopters with negative fundi and media. Muscle study reveals slight lagging of the right eye on adduction and a slight convergence weakness. Muscular exercises improved the convergence and diplopia but were without appreciable effect on the lagging in adduction. The patient has been under observation for two years without improvement and the diagnosis was corroborated by neurologic examination of Dr. W. H. Mayer.

Discussion. DR. EDW. STIEREN emphasized that diplopia was often the earliest symptom and muscular palsy the most frequent symptom of encephalitis lethargica.

THOS. H. MANLEY, JR.
Reporter.

MEMPHIS SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY.

November 9, 1926.

DR. J. B. STANFORD, Presiding.

Membranous Conjunctivitis.

DR. E. C. ELLETT presented N. D., aged 5 who was shown about a year

ago during a previous visit for treatment. This patient returned after an interval of ten months during which time she had been perfectly comfortable. On September 11, 1926, there was an acute recurrence of previous symptoms, such as edema of the lids, inflammation of the conjunctiva, and a serosanguineous discharge from both eyes, accompanied by a severe photophobia. She was brought to the office five days later, when examination disclosed a heavy, gray, gelatinous membrane apparently originating at the upper fornices and hanging down like a veil between the upper lids and the corneae. This stripped off rather easiy, leaving a raw conjunctival surface with petechial bleeding points. Manipulation was very painful. The corneae were densely vascularized, but from below as well as above. The vascularization was from the conjunctiva, which was very hyperemic and beefy looking over the globe. Culture was reported as streptococci. Treatment of this condition at the previous visit had been with optochin, with good results, and this was immediately reinstituted in addition to atropia. There was no improvement for five days, after which time she received a daily application to the conjunctiva of 2% silver nitrate. There was immediate improvement under this treatment, the membrane gradually diminishing in amount until it is now present only in rudimentary amounts at the fornices. The ocular conjunctiva has become quiet, and the cornea have cleared considerably. The child has now no symptoms except a slight mucous discharge.

Glaucoma.

Dr. E. C. Ellett presented two patients.

Case 1. W. L., aged 52. This was a case of simple glaucoma followed since May, 1926, with a history of aching pain in eyes and some constriction of visual fields for the past year. Vision was 20/60 and 20/40, tension Schiötz, 60 and 47. Both eyes were small, almost microphthalmic with advanced glaucomatous cupping and retinal arterial pulsation in the right and slight cupping in the left. The fields were markedly constricted in the right eye, moderately so in the left. Eserin ¼% was prescribed with varying results on the tension which at one time fell as low as 15 and 18, later rising to 32 O. U. October 29, vision O. D. was 15/50, improved by plus 1.50 sph. to 15/25. O. S. was 15/20, improved by minus 25 sph. to 15/16.

The fields of vision were much constricted, especially the right. A trephine was advised on the right eye and because of the limitation of field this was done with a peripheral iridectomy on November 5th.

Case 2. Mrs. J. W., aged 68. This was another case of glaucoma seen also in May, 1926. There was no complaint except failing vision. The vision was 10/200 and hand movements, discs were cupped, very much so in O. S., and the tension was 52 O. U. Eserin ointment was prescribed. She was not seen again until November 1, when the vision O. D. was 10/200 with minus 3.50 sph. improved to 20/70; O. S. equaled hand movement. Tension was 50 and 70, and both fields were contracted. Double trephine was done November 3. A buttonhole iridectomy was done on the right eye, but this was not intentional. It was the best that could be done on account of an incomplete trephine opening. Complete iridectomy left eye.

Discission and Linear Extraction.

Dr. E. C. Ellett presented a patient, R. W., aged 19, who was seen in May, 1926. There was a history of sore eyes accompanied by fever at the age of four, since which time both eyes had shown large scars on the cornea and the vision had been poor. Both eyes showed an adherent leucoma in the lower part of the cornea, with partial posterior capsular cataracts. The left eye showed also a brownish pigmented deposit on the anterior capsule. The fundi showed posterior staphyloma in each eye. Vision was 3/200 and 5/200, improved by minus 7 lenses to 15/200 and 15/70. Tension was normal. The right eye was operated on May 25, a discission of the soft cataract being done with the Ziegler

knife. The whole lens became opaque and swollen and slowly absorbed without a rise in tension. Vision on November 3 with plus 3 sph. was 15/50.

November 2, a similar discission operation was done in the left eye. The knife needle cut thru the brown, pigmented covering of the anterior capsule, which retracted like an elastic membrane on a stretch. The lens cortex escaped freely thru the opening in the capsule and became swollen and opaque. The pupil dilated fully and freely. Six day later the eye became red and painful and tension rose to plus 2. A linear extraction of the free lens cortex was immediately done (November 8) with decrease in tension.

Papilledema.

Dr. P. M. Lewis presented a patient, C. W., colored female, aged 26, who was seen on Oct. 26, 1926. She gave a history of loss of sight of the left eye for past month. She thought the right eye was becoming involved. There was no pain and headaches were not marked. She had no vomiting. General health was excellent.

Examination of the eyes was entirely negative with the exception of the left fundus. Vision in O. D. was 20/20, in O. S. it was hand movements in temporal field. Fields and blind spot of right eye were normal. Left eye had no light perception in upper or lower fields, and there was a large central absolute scotoma. The fundus showed a greatly swollen nervehead. Its size appeared to be about two and a half times that of the right eye, and the elevation was about 6 or 8 diopters. The veins were greatly engorged and there were a few hemorrhages on the disc. The retina was edematous thruout, but contained no hemorrhages or exudates. The vitreous contained numerous opacities.

A Kahn precipitation test of the blood was found negative. Roentgen ray pictures of the nasal sinuses and orbit revealed nothing pathologic except a slight cloudiness of the ethmoids. Dr. Lipsey opened the ethmoidal labyrinth on October 28. Some polypoid degeneration was found but no improvement followed operation. Urinalysis was negative.

Patient was referred to the Memphis General Hospital for neurologic examination, but that had not yet been made.

Discussion. Dr. Ellett said the case was not an ordinary papilledema. It was unilateral; there was a great amount of swelling and vitreous opacities which suggested an inflammatory process around the disc rather than behind it. Observation was advised. There was also a possibility of tuberculoma of head of optic nerve.

Dr. Phil Lewis' examination at first showed 6-8 diopters of swelling. There was a history of a possible injury on side of the head. Dr. Lewis did not know what to call it. There were no symptoms of intracranial pressure, but a lumbar puncture would be made.

Dr. Lipsey said an anterior ethmoidectomy on both sides, posterior ethmoidectomy on the left with no packing, was performed and the patient was to return in two weeks for sphenoidectomy.

Dr. J. B. Blue said the elevation was 3 or 4 diopters. He did not think it was a choked disc from intracranial pressure.

Trachoma Specimen.

Dr. Ellett presented a tarsus and overlying conjunctiva removed from a patient with chronic trachoma. The section showed extensive scarring of the subepithelial tissue together with some focal accumulation of round cells.

P. M. Lewis,
Secretary.

THE MEDICAL SOCIETY OF THE DISTRICT OF COLUMBIA.

Section on Ophthalmology and Oto-Laryngology.

October 15, 1926.

Dr. W. T. Davis, Chairman.

Chronic Toxic Retrobulbar Neuritis.

Dr. Carl Henning reported the case of L. A., white male, aged 48, whose ophthalmic records he had made over

a period of twenty years, during which time the patient's vision had remained 20/15 in each eye.

When seen Aug. 3, 1926, O. D. V. = 10/200; O. S. V. = 18/200. The pupils were 3 mm. in diameter, irregularly round, dilated very slightly under euphthalmin, contracted not at all to direct light or in convergence.

Form fields were normal; red and green concentrically contracted. Each eye had an absolute paracentral scotoma of 30° diameter for red and 10° for green. Blind spot, O. D. was 8°x10°; O. S. 10°x11°.

There was a history of excessive use of alcohol and tobacco. He had voluntarily placed himself in a local sanitarium and had stopped entirely the drugs for three weeks before consulting an oculist. At this institution he had intensive baths and hydrotherapy.

Ophthalmoscopic examination was negative.

Dr. Henning said the pathology of this condition has been found to be an axial interstitial neuritis with increase in the trabeculae, thus pressing on the axis cylinders in the papillomacular bundle. Most of the cases occur in males, over 40 years of age, but there probably must be an idiosyncrasy. The small pupil has been attributed to the action of nicotin on the sympathetic, and the inability of the pupil to contract to light to a toxic action on the third nerve. Retrobulbar neuritis has been divided into the nontoxic and the toxic forms. The former are mostly multiple sclerosis, lues and hereditary disease of the nervous system. The toxic forms are due to alcohol, methyl or ethyl, tobacco, iodoform, arsenic, etc.

Treatment was removal of the drugs with administration of strychnin, by mouth, to saturation; elimination by hydrotherapy; rest and feeding. Patient improved rapidly physically. August 13th, the vision was 20/200 and 20/100. September 3rd, it was 20/50 and 20/70; Sept. 17th, 20/40 and 20/40—. On September 3rd, the blind spots were 7°x8° and 6°x8°. October 15th, the vision was 20/40+ in each eye and with spherical +2.0 added to his distance correction he could read Jaeger 4. At this last date the green scotoma had vanished. Central red scotoma was reduced to 20 degrees in diameter and the color fields slightly enlarged in size.

Total Posterior Synechiae.

Dr. J. Beatty Griffith reported the case of A. C., male negro, aged 39, examined at the eye clinic of the Episcopal Eye, Ear and Throat Hospital.

History: General: Syphilis extending over a long period of years, with apparently thoro treatment.

Eyes: Five years ago both eyes became somewhat red and vision began gradually to fail. Three years ago became "blind" in each eye.

Examination: Two infected teeth. Otherwise negative including blood Wassermann.

Eyes: Each eye shows the following: Light perception, quick, accurate response. Cornea normal. Anterior chamber about normal depth for age. Iris: synechiae, posterior, total. Pupils secluded. Tension: O. D. 5; O. S. 6 (Schiötz).

In each eye the posterior synechiae were unusually complete, the fixed position and the slight convex contour of the iris surface indicating that adhesion to the anterior capsule was as complete as the anatomy of these structures permit.

Treatment: The two infected teeth were extracted. Altho the blood Wassermann was negative, the patient was placed on an active antisphilitic treatment for two months preparatory to operation on the right eye. Obviously, surgery offered the only hope of visual restoration.

He said he had then to decide whether to attempt a one, or several stage operation. The low tension, the large surface of synechiae, the likelihood of degenerated zonule and the fluid vitreous, together with the well recognized postoperative tendency of such old uveal diseased eyes to develop a fresh uveitis with exudate, decided him against a one stage operation.

Operation: To partly clear the field for later lens extraction, he decided to

do a series of iridectomies and to space these at three month intervals. Each was planned with particular attention to subjecting the eye to the least possible amount of trauma. Altho the blood Wassermann remained negative, active antisyphilitic treatment was given before each iridectomy. At each operation a very sharp, moderate sized keratome was used and no attempt was made to remove iris tissue other than which lay easily beneath the iris forceps. A total of four iridectomies was done, resulting in removal of the upper one-half of the iris stroma.

In the first, third and fourth iridectomies, postoperative healing was quiet and rapid. After the second there was a moderate amount of hemorrhage in the anterior chamber, its absorption time being average.

It was now believed that the patient was ready for extraction. He planned a large conjunctival flap, with flap sutures; the usual cataract incision; freeing the lens as gently as possible from remaining synechiae below and from any other obstruction; delivery according to lens behavior, using pressure, spoon or forceps. The speaker recognized the fact that such cases ordinarily do not react kindly to operation; his reason for presenting this case was to gather the opinions of his colleagues as to whether the wise course in such cases is to plan successive operations, each to give minimum trauma and each followed by a long rest interval, or to attempt a one stage operation, the latter necessarily calling for much manipulation and resulting trauma, but saving the necessity for a series of lesser traumas.

Discussion. Dr. Carl Henning said the essayist was right in performing the operation in several stages, and he had exercised proper care in removing focal infection and in administering antiluetic treatment. The patient had a good chance to recover at least some vision. The low tension indicated disease of the ciliary bodies or the retina and prolonged instillation of atropin was advisable. The trauma of attempting to loosen the attachment of the iris to the anterior capsule might result in a severe flare up, and it might be better to cut carefully the anterior capsule in a circular manner close to the iris and remove this piece with a capsule forceps.

Dr. Oscar Wilkinson remarked that the probability of securing good end results in cases in which the tension was as low as it was in the case presented was rather remote. He advised, before operation, the use of mercury and the iodid of potash and considered that there was little hope of a good outcome but felt that operative procedure was justifiable considering the present state of the patient.

Dr. A. P. Tibbets said altho this patient had never been under his direct care, he had had an opportunity to observe him in two clinics for the past four years. When first seen he was suffering from an iridocyclitis which proved very resistant to treatment. He gave a history of an old luetic infection, and altho the blood Wassermann was negative, there were other clinical signs of this disease.

In spite of the removal of all discoverable foci of infection, together with intensive antiluetic and local treatment, the disease steadily progressed. About a year ago he was under treatment in another clinic with the diagnosis of optic atrophy.

While any operative treatment that offered hope of improving vision was to be strongly recommended, it seemed doubtful whether any marked improvement could be obtained.

James N. Greear, Jr.,
Secretary.

COLLEGE OF PHYSICIANS OF PHILADELPHIA.

Section of Ophthalmology.

October 21, 1926.

Dr. Edward A. Shumway, Chairman.

Traumatic Enophthalmos.

Dr. William Zentmayer presented L. D., colored, aged 62 years, who was injured in an automobile accident Dec. 12, 1925. She received a compound comminuted fracture of the skull in-

volving the orbital bones, with laceration of the soft tissues which necessitated the enucleation of the right eye.

She came to the Wills Hospital on May 21, 1925, to learn whether anything could be done to make the left eye useful.

There is evidence of the injury in the flattening of the bones in and about the orbits, with exostoses and scars in the soft tissues, causing contraction of the palpebral fissures. On the right side the socket is in a fairly healthy condition. In the left orbit there is a mass of granulation tissue just behind the semilunar fold.

There is a high degree of enophthalmos, the globe being fixed against the inner wall of the orbit midway between the base and apex. The eyeball appears to be of normal size. The cornea is hazy, and the anterior chamber apparently of normal depth. There are several posterior synechiae. The vision is reduced to hand movements.

During the late summer of 1926, she had an abscess of the lacrimal sac on the right side which was treated by Dr. Tassman.

The patient states that the discharge formerly came from the orbit on this side and now has ceased to do so and seems to be coming from the sac.

Examination by Dr. Skillern showed no evidence of ethmoidal disease nor any connection between the ethmoids and the lacrimal fossae.

Bilateral Symmetric Congenital Dislocation of the Lens.

Dr. Wm. Zentmayer exhibited the patient to show the result secured by the operative procedure employed in the left eye.

The child, who is seven years old, was shown before the Section last Spring and there was considerable discussion as to the best method of treating these cases.

Four discissions were done on the left eye. The vision, with correcting lenses, is now 6/5. The pupil is active. When dilated, only a trace of capsule can be seen near the pupillary margin, down and in.

Two needlings have been performed on the right eye. All the operations were done under local anesthesia.

Hematogenous Siderosis.

Dr. T. B. Holloway presented a woman, aged 45, whom he had examined at the University on the service of Dr. Stengel. Upon admission she complained of blindness of the right eye and impaired vision of the left. The patient was a housewife, and denied any trauma affecting either eye and any acute inflammation of the eyes. There was a history of diabetes dating back two years, altho at the time of admission to the hospital her urine was sugar free and her fasting blood sugar 0.143. Her blood pressure varied from 186-112 to 210-130.

The right eye was blind; vision of the left, 6/9. The right iris was greenish brown, the left blue. Examination of the eye with corneal microscope and slit lamp revealed several pin point, grayish dots on Descemet's membrane; the aqueous was clear. There was a partial absence of the uveal border to the pupil. Scattered over the anterior surface of the lens, and arranged in an irregular circular or wreath like manner, there was a series of a dozen or more small, circular lesions with central rust colored spots; these lesions extended thru the capsule into the anterior stromal layers. On the capsule down and in there was a small nodule of uveal pigment, evidently the site of a small synechia that had torn loose.

In the lens there were a number of isolated, dot like opacities. The extreme posterior cortical layers appeared buff colored. In a careful search over this area, a translucent crescentic area could be noted and, in endeavoring to see the vitreous thru this fissure, one could note a wave like motion at the buff colored edge, doubtless due to a free margin of pigmented exudative layer covering the posterior surface of the lens. No view could be obtained of the vitreous. With the ophthalmoscope there was no fundus reflex.

There were peripheral lens striae with punctate opacities and hemorrha-

gic masses in the lower portion of the vitreous of the left eye. The disc was pale and the vessels showed excessive angiosclerotic changes. Below the macula there was a large preretinal hemorrhage. In the macular region there was a cluster of tallow like exudates, such as are seen frequently in so called diabetic retinitis. There was a large hemorrhagic area in the lower mid zone. The lower periphery could not be seen owing to the hemorrhage into the vitreous.

DR. HOLLOWAY referred to the literature and the few cases of this type that come under observation. He stated that it was the first typical case of this character that he had observed.

Presentation of Instruments of Dr. William F. Norris.

DR. BURTON CHANCE said that to those present who had been associated with Dr. Norris, the sight of these instruments must bring a pang of remembrance of his greatness and his usefulness.

It is fitting that these instruments should be given into the keeping of this Section of the College, because, thru Dr. Norris' enthusiasm for the development of Ophthalmology in Philadelphia he became one of the founders of the Section, and in its affairs he manifested the keenest interest to the last of his days.

So pronounced was Dr. Norris' personality, and, thru his teaching, so permeating his influence, that, to some who survive him, he seems to be still in the flesh and ever ready and willing to counsel and advise them, as well as to share their enthusiasms for their own new found facts and methods of treatment. It does not seem possible that he has been gone from us twenty-five years.

William Fisher Norris was born in Philadelphia in 1839, the son of a distinguished Fellow of this College. After graduating from the University Medical School, then on Ninth Street, he entered the Union Army as an Assistant Surgeon and served thruout the war. While in the army he became interested in photography; and, from that pastime he turned to the elucidation of questions in optics, and later he desired to study the diseases of the eye. To this end he determined to visit Vienna.

This step was taken in spite of the fixed opposition manifested by his devoted father and his many professional friends who could not conceive, so he told the writer, that one could confine himself to the care of a special organ of the body from any high and ethical motive. Despite his personal wealth and social position, he went, nevertheless, and became the devoted and industrious student of Arlt, Jaeger and other teachers who were creating ophthalmologic science as we now know it. His individual researches were remarkable for so inexperienced an American student.

Upon his return to Philadelphia, he established a public and private practice which was recognized only after he had overcome the obstinate opposition of his friends and the practitioners whose support he longed to have. Dr. Chance did not enumerate the many positions that Dr. Norris held but alluded to them only to draw attention to his painstaking devotion and indefatigable zeal in all he undertook. In time, largely at his own expense, an ophthalmologic department was established at the University; indeed, the Hospital itself owes much to his initiative and unfailing support.

For many years he was Surgeon at the Wills Hospital. It was there that Dr. Chance had the honor to serve him as House Surgeon and there shared his friendship.

Dr. Norris in his numerous writings was most courageous in publishing the results of his studies, his clinical observations, and the effects of his surgical and therapeutic methods; in all, he sought to teach as well as to show forth his own successes. The College possesses all his writings, which are sound, and certainly have became Classics; all are worth reading today. He was modest as to his own powers and commonly diffident in the presence of strangers and before those whom he

deemed unenlightened in the subjects about which he intended to speak. To his friends and colleagues, he was kind, loyal, and unaffected. His contributions to the proceedings of this Section were recalled. At those meetings he assumed that all were cognizant of the principles which he elucidated, in all of which there were charm and directness still unexcelled by his successors.

As an operator, he was not brilliant, tho he was calm, deliberate, and painstaking. He never operated for the sake of operation. With the sick poor, in his hospital practice, no one was so gentle, so patient, so considerate as was he; but woe to the man or woman, on the pretense of worthiness obtained admission to the wards, who tried to impose upon his generosity. Dr. Norris' ideals governing the conduct of the medical life were of the highest and noblest, and he labored to advance ophthalmology to a fit place in the Sciences; with what success he labored the endurance of this Section well attests.

Dr. Chance said, "There are some here who knew him more intimately perhaps and for more years than did I, yet they cannot have had a greater respect for him than was mine, and, while he, years before, might have been considered the Father of Ophthalmology in his community, he was indeed as it were, my 'Father' in the study. It is with that affection that I offer, in the name of Dr. George Norris, these cases of instruments to be preserved in the College in memory of one of its most distinguished Fellows."

Vaccination Ulcer of Eyelid.

Dr. Burton Chance wished to have recorded a case of vaccine ulcer of the eyelid, as it is but the fourth case he can recall having seen. He regretted the patient had not put in an appearance. She is a Southern negress who had never been vaccinated, but her young girl was vaccinated recently at school. Three or four days after this the woman's left upper lid began to swell, and a small pimple developed. About ten days ago she applied at Wills Hospital in the morning hours for relief of the swollen and painful lid. The house surgeon lanced the lid, naturally seeking to relieve the tense lid, but there was no effusion. In the afternoon we observed a more or less round vesicular papule on the tarsal border, which in a day or two became crusty and assumed the aspect of a vaccination sore as seen elsewhere. It has progressed as would an ordinary vaccination lesion.

Juvenile Cataract Secondary to Uveal Disease.

Dr. C. R. Heed exhibited a girl, aged 4 years, with cataract of the right eye, secondary to uveal disease. The child had been in perfect health, and at no time was there any congestion of the eyes. Early in April last, the mother noticed a white film in the pupil of the right eye. Examination at that time showed light projection of the eye apparently normal; pupil 4 mm., no reaction to light; ocular rotations unimpaired; convergence about 25 degrees. Atropin instilled and after one hour failed to show any dilatation. The pupil of the left eye was 4.5 mm. and did not react to light. After the use of atropin for two weeks, there was shown almost complete synechia of the right eye, and three-fourths of the pupillary margin of the left eye adherent. Tension was normal. The left eye showed a slight wrinkling of the anterior lens capsule, the vitreous clear, disc and retinal vessels healthy. No evidence of retinal or choroidal disease was present. Physical examination and roentgen rays of the chest were normal; Wassermann was +1. Diseased tonsils and adenoids were removed. The atropin was continued, with gray powder internally. In October, the ocular condition remained unchanged with the exception of a reduced tension of the right eye. The iris did not push forward to indicate lack of drainage into the anterior chamber. The case possessed interest from the existence of a prolonged iridocyclitis, with no noticeable signs of external congestion.

Calcareous Film of the Cornea.

Dr. Leighton F. Appleman presented a man, M. S., aged 68 years, a

hatter by trade, who showed, originally, bilateral calcareous film of the cornea. At this time the film was still present on the right cornea, while the left eye shows the condition following its removal.

This patient came under observation with the statement that both eyes had been affected since 1908, beginning as a film over the sight which film gradually grew more dense. As direct vision became impossible, an optical iridectomy had been done in each eye about 1910, at the lower part of the iris, which had enabled him to continue at his work until he presented himself at the Wills Hospital in September, 1925. on account of failing vision. This failing vision was seen to be due to cataract in each eye in addition to the film. It was decided to remove the cataracts which was done without unusual reaction in either eye and with very little secondary capsular remains.

Vision, following the cataract operations, while greatly improved for objects in his lower field, was still impossible at distance because of the corneal films.

These opacities occupied the centers of each cornea, corresponding in shape and area to that exposed when the lids were partially closed, being 5 to 6 mm. wide over the center and extending laterally almost to the limbus on either side. The epithelium over this area was perfectly smooth, not elevated above, nor depressed below that of the clear cornea around this area. In macroscopic appearance, it was uniformly white, dense, somewhat granular and superficially located.

With the slit lamp, it was of a mosaic character, having the general appearance of hexagonal figures of a grayish granular character outlined by lines of purer white. In one or two places fissures could be seen, running vertically, and in these fissures the substance of the cornea was apparently perfectly clear. It could readily be seen that the condition was very superficial, just beneath the epithelium, and it was decided to attempt removal.

Under local anesthesia, the epithelium of the cornea of the left eye was disintegrated over the nasal portion of the opacity by the use of Shahan's thermophore at a temperature of 170 degrees for about 45 seconds, then, with a small sharp curet, the plaque, which to the touch felt distinctly calcareous, was peeled off in small flakes, leaving the cornea somewhat roughened but otherwise apparently clear.

As it was feared that undue reaction might follow the procedure, only the nasal half of the opacity was removed. However, scarcely any reaction followed and the epithelium had regenerated to such an extent at the end of 24 hours that only two pin point stains were revealed after the use of fluorescein, altho the cornea appeared roughened. This smoothed out within the next two or three days until the surface was level with the rest of the cornea. About one week later the remainder of the opaque area was treated in the same way, again without reaction.

Following the removal of the superficial plaque, it was seen that a faint haziness of the substantia propria existed which could not previously be recognized. This no doubt was due to nutritional changes which allowed the condition to develop simultaneously with the deposition of calcareous material in the superficial structure.

Direct vision in the operated eye was 5/60 a short time after his operation, with the correcting lens which he had previously worn.

Corneal Tumor.

DR. APPLEMAN also presented a man, aged 48 years, who showed a growth of the cornea of the left eye of about two years' duration, arising just within the upper limbus, firmly adherent, of a mottled pink color and soft consistence. By pressure of the lid, it had become flattened and spread out like a mushroom over the conjunctiva but not attached thereto as could be demonstrated by the passage of a spatula beneath it. Extension downward as a thin vascular veil or film over the cornea had occurred almost to the pupil-

lary border so that the vision of this eye had begun to blur.

The patient experienced no pain. As he had just come under observation, no microscopic study had been made, altho the possibility of sarcoma of the cornea had been seriously considered.

Tucking Operation for Strabismus.

Dr. Thos. J. Clemens described an operation for correcting squint for which several distinct advantages are claimed over the usual method now in use. The operation consists of tucking or folding the tendon of the muscle upon itself and attaching the distal end of the tuck to the point of the insertion, the folded tuck being depressed between the sclera and the muscle itself. There are only two sutures used for the entire operation.

The patient is placed under a general anesthetic, and the technic is as follows:

An initial incision is made vertically thru the conjunctiva about 8 mm. from the limbus, Tenon's capsule is opened and the tendon of the muscle exposed in the usual manner. The tendon is picked up with the strabismus hook and cleared of adhering tissue to the extent of 10 to 12 mm. The tendon is then scarified along the superior fibers to the extent of the proposed tuck. Two double armed sutures of No. 6 twisted black silk, 10 or 12 inches in length, are required. The strabismus hook being elevated, one needle of a double armed suture pierces the tendon from below close to its scleral insertion—the needle being carried thru the insertion picking up some fibers of episcleral tissue in its passage and emerging thru the anterior aspect of the insertion. The needle is then continued thru the conjunctiva close to the sclerocorneal junction. This suture may be designated as No. 1 suture. Another suture is passed exactly in the same manner from the other side of the muscle and designated as No. 2 suture. The needles are then removed from that end of the sutures.

The armed end of suture No. 1 enters the posterior aspect of the tendon from below choosing a point farther back as the angle of the strabismus is larger, and then passing the needle under the posterior flap of the conjunctiva it emerges on its outer surface, when the needle is removed.

The second suture is passed thru from the other side of the tendon in like manner. A specially designed tucking instrument is now adjusted as follows:

The female member is passed beneath the tendon while the male member is passed over the tendon and beneath the sutures. The tucker is now adjusted to the amount of correction desired, forcing the loop of tendon into the space between the sclera and muscle. The sutures are then tied, the assistant tying one and the operator the other, and the wound drawn together fairly firmly, bringing the wound into apposition, while the tucker is still *in situ*. The tension is then relieved from the tucker and the arms are allowed to come to an even plane, when it is withdrawn. The sutures are then tied securely, closing the wound and at the same time bringing the fibers of the tendon into apposition.

There are several distinct advantages gained by this operation. 1. There is no destruction of tissue. 2. Ease in operating. 3. Anterior fibers of tendon brought forward and united at their original insertion—a real advancement. 4. Ability to control the amount of tuck. 5. Suppression of tucked loop, leaving no unsightly lump. 6. Very little reaction and practically no scar.

Discussion. Dr. B. F. Baer, Jr., stated that he had the opportunity of seeing a certain number of these cases upon whom Dr. Clemens had performed his modified Todd tucking operation. In each of these cases Dr. Clemens had performed, in addition, a tenotomy upon an internal rectus muscle. The results were excellent and there was not the lumping of the tucked muscle which is the objectionable feature in the Todd Operation. If he were to do this operation, he would not combine it with an immediate tentomy of an antagonistic muscle, but would defer the tenotomy until a later date.

Dr. Edwin B. Miller reported that he had performed a tucking according to the method of Dr. Clemens and had found it all that had been claimed for it. Instead of ether anesthesia, he had used novocain and cocain, injecting the novocain well back over the muscle to be operated upon. Doing this operation for the first time, he did not get the stitches back far enough; and, as the eyes were not quite in parallel, he did a graduated tenotomy on the opposite muscle. Dr. Miller stated that he had the opportunity of seeing some of the cases operated upon by Dr. Clemens two or three weeks following the operation and the results were almost perfect. No reaction, no swelling or lump over the muscle, and full movement in all directions.

Dr. Luther C. Peter stated that he believed that there is a distinct field for tucking in the lower degrees of squint and the higher degrees of heterophoria. The difficulty which he has experienced in the past in tucking operations is the tumefaction which occasionally appears after the use of chromasized catgut. In a number of cases, this tumefaction will last for a couple of months. They are rather distressing to the patient and annoying to the surgeon, but ultimately become absorbed and leave no scar. In a few instances, he has been obliged to remove the catgut, which failed to absorb. More recently, however, he has found plain catgut quite satisfactory, and has not observed such swelling over the site of the operation. The distinct advantage, however, which he sees in the method of introducing the sutures, as proposed by Dr. Clemens, is the use of silk instead of catgut. If our technic can be changed so as to use silk instead of catgut, he believes there would be a distinct advantage gained for this operation.

Dr. Burton Chance stated that he had witnessed a number of Dr. Clemens' operations, from the second of his cases. He was impressed by the accuracy of the adjustment of the parts, and he noticed that the reaction and infiltration of the conjunctivoscleral tissues was not as great as he had observed in other forms of tucking operation.

Corneal Lesions.

Dr. G. E. deSchweinitz and Dr. Perce Delong exhibited a series of microscopic slides indicating various lesions of the cornea, associated with the exhibition of a number of lantern slides illustrating slit lamp appearances of similar corneal diseases.

Leighton F. Appleman, Clerk.

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HEALTH EXAMINATIONS OF THE EYES.

The testing of the refraction of the eyes and prescription for the proper lenses, is probably the nearest to a periodic examination of apparently healthy persons that has been widely resorted to by patients and generally advised by physicians. In a large proportion of cases, particularly among persons who have reached or passed middle life, the patient seeks it not because of any evidence of disease, but because of some temporary discomfort, or lessened endurance of eye work, or even because he believes the time has come when such departure from health may be impending, or the time has arrived when the glasses ought to be changed.

Such changing of glasses is an important part of the work of the oculist, and it should be done with a full sense of the responsibility that is implied by periodic health examinations. It is not to be made merely with the idea it is an opportunity to gain a fee, or to sell a pair of spectacles. Such an attitude might be pardoned in one who was ignorant of the essential unity of health and the interdependence of all the bodily functions, but not in the physician. To realize that the measurement, or remeasurement for glasses, is a health examination, only complete when all conditions helping or impairing health are considered, is the proper understanding of the situation for both physician and patient.

Even for the school girl complaining of headaches, or abnormal eye movements, it cannot be determined whether these belong to eyestrain, or are due to sinus disease, intracranial conditions, faulty nutrition, bad habits of using the eyes, or manner of living in other respects, except by keeping these possibilities in mind and considering everything that may throw light on any condition that might unfavorably influence the general health. In adults the recognized dangers that threaten later life are first and most strikingly manifested thru changes that can best, or only, be studied in the eyes. The repeated examinations for progressive presbyopia can be made the most valuable kind of health examination for people who begin to understand that health is a valuable possession to be kept and highly regarded; and are not satisfied to follow the usual careless plan of wasting it, and then in late repentance, or panic, seeking if it may not be regained by drugs or operations. The presbyope should be asked to return for re-

examination, more to keep tab on his general and ocular health, than for the mere change of reading glasses.

Every examination that an oculist makes, of the ocular refraction, should partake of this character of a health examination. Accurate measurement of ametropia, accommodative power and muscle balance are worth while, and far more valuable than hasty approximate estimates. But painstaking measurements of these are only a one-sided investigation of the patient's condition and needs. Every presbyope should be looked at with the ophthalmoscope, and often field taking and biomicroscopy should be resorted to. To make certain of the presence or absence of beginning cataract, early glaucoma, angiosclerotic changes or impaired nutrition in his optic nerve, may be of far more importance to him, than the fact that he has to hold the newspaper at arm's length to read it.

To regard each refractive examination as part of a health examination will be productive of good in several ways. It will secure a more comprehensive view of the nature and relations of eyestrain, or nerve strain thru the eyes. It gives a wider experience of the interplay of eye work and other factors disturbing the balance of health. Most important suggestions will come from it, as to other things besides the wearing of glasses, that the patient must attend to, if he is to secure complete relief from his symptoms. Glasses may give complete relief in connection with proper habits of living, exercise and working; and fail to give relief without these necessary adjuvants. To attend to them is just as important as to give glasses of the right strength and to see that they are properly placed before the eyes.

To have in mind, in each case, all the things that conspire to bring a certain result will give a more exact and certain knowledge, a broader view and experience, that always make their possessor a more skillful and more valuable advisor. It raises the fitting of glasses from the plane of the optometrist, the measurer of eyes, to the sphere of the physician, who takes for his field all knowledge and considerations that influence the gaining and maintenance of health. The union of the minute accuracy and manifold resources of a specialty with the broad view of life and health as a whole, is the highest development of modern medicine. It is worth while for every oculist to strive toward it.

E. J.

THROMBOSIS OF THE CAVERNOUS SINUS.

This condition raises the important issue of differential diagnosis between orbital inflammations with swelling and the deeper and more dangerous lesion. The latter may start in the former, but more commonly takes its origin from suppuration in some other part of the head or body. A sign to which attention was called in 1909 (Ophthalmology, v. 5, p. 189) has not been emphasized as it should be in the literature, and is not mentioned in a recent monograph on thrombophlebitis of the cavernous sinus (see A. J. O., v. 9, p. 913).

For the mass of cases phlebitis is the important pathologic feature and connects the cavernous sinus lesion with the patient's general condition, and the method by which the thrombosis is produced, in most cases. But cases occur in which there has been no infection, and thrombosis arises from marasmus, the slow circulation of the blood in the cavernous sinus favoring the development of a thrombus in that situation. In the majority of cases, however, there is an infective lesion on one side of the head, which might easily give rise to orbital phlebitis of the same side.

When, however, the orbit of the opposite side is involved first, or most extensively swollen, suspicion should be aroused that the cavernous sinus is the place that the thrombosis has occurred, which is producing the swelling. This is important in the cases in which the surgeon has to decide if incisions in the depth of the orbit are indicated, or whether these offer no chance of arresting the process;

and draining of the cavernous sinus by the most promising procedure should be tried. Thrombosis of the cavernous sinus will always be a very serious condition. But early, definite recognition, and prompt radical operation, will probably save the lives of some patients affected with it.

E. J.

ANNUAL OPHTHALMIC MEETINGS.

These are an essential feature, for every one who makes his main business in life the study and practice of ophthalmology. Those who have local societies generally understand the importance of getting into a larger circle of their fellow-workers, if only for two or three days each year; and the greater certainty of having a vacation, if some such gathering gives it a date and a direction. But for isolated specialists, who have only general medical meetings that they can join thru the year, the contact with workers in their own department of medicine, once a year, is necessary to any survival of interest in the work they have undertaken to do.

In America, where such societies meet in successive years in places widely removed from one another, the place and exact time for meeting this year is likely to be determined by convenience and interests quite different from those that have been influential in preceding years. It is therefore needful to have these dates early in mind, that plans quite different from those followed before can be worked out for each year's trip and meeting.

For its 1927 meeting the American Medical Association goes to Washington, D. C., where the Section on Ophthalmology will hold its meetings the afternoons of May 18, 19 and 20. There are many things worth seeing in and around that city, and at that time spring merging into summer presents them at their best.

The American Ophthalmological Society for the first time holds its annual meeting, the sixty-third, outside of the United States. It meets in Quebec, June 27, 28 and 29, the time of year when that part of Canada musters its full summer attractions about the old French capitol, rich in historic associations.

The American Academy of Ophthalmology and Oto-Laryngology will this year meet in Detroit, September 12 to 16, inclusive, putting into operation new plans for its successful section for graduate study and bringing those who attend in touch with the greatest industrial development of our time, as well as the natural charms of the St. Clair river.

The Pacific Coast Oto-Ophthalmological Society this year leaves the coast to assemble at Spokane, June 6 and 7. This time and place give a date and an objective for a trip to the Pacific Northwest. To go, to or from Spokane, by the Northern route over the Canadian Pacific railway, and its steamers on the Columbia River and the Kootenay Lakes, is a most attractive way of seeing the finest mountain scenery easily accessible in America. The Colorado Congress and two weeks intensive course on Ophthalmology and Oto-Laryngology will come in July 11 to 23, with its usual attractions.

For those who plan to see Europe the coming summer, the list of ophthalmic societies is equally attractive. The Ophthalmological Society of Egypt meets in Cairo the last of February or first week in March. The annual Congress of the Ophthalmological Society of Great Britain will be held in Liverpool, April 29, 30, when the English spring will be at full tide. The French and Belgian societies meet in May. The German Congress meets at Heidelberg, June 9 to 11. The Oxford Congress will meet the middle of July. The Spanish Congress will hold its next meeting in September, 1928. The Italian Society meets the 14th to 16th of October.

E. J.

BOOK NOTICES.

Die tuberkulosen Erkrankungen des Auges. Dr. Rudolf Bergmeister, Privatdocent University of Vienna. Paper 8vo., 150 pages. Berlin S. Karger, 1927.

This monograph is dedicated to the father of the author. It is based upon clinical experience in the Wilhelmina Hospital in Vienna, and upon the literature of the subject published in Germany. There are no illustrations, and little description of histologic changes. The body of the work is divided under the following headings, to each of which is added the number of pages given to it.

I. General Relations of Body Tuberculosis and Tuberculous Eye Diseases, 8 pages.

II. Tuberculosis of the Conjunctiva, Lacrimal Sac and Lacrimal Gland, 12 pages.

III. Phlyctenular Eye Diseases and Epibulbar Tuberculosis, 34 pages.

IV. Tuberculous, Nonphlyctenular, Corneal Disease, Sclerosing Keratitis and Scleritis, 10 pages.

V. Tuberculous Diseases of the Uvea, 38 pages.

VI. Relation of Uveal Tuberculosis to Diseases of the Retina and Optic Nerve, 25 pages.

VII. Syphilis and Tuberculosis, 11 pages.

VIII. General Therapeutic Observations, 15 pages.

There is no index to the book. It is a good one to read systematically, but is not arranged for ready reference. The owner who has once read it, can mark the more important points in a way that will make it easy to refer to them. But the brief table of contents above translated is a poor substitute for an alphabetic index. With an index it would be very serviceable, altho not a complete work of reference.

E. J.

Optotypes Consisting of Test Letters and Pictographs for Measuring Acuteness of Vision. John Green, M.D., L.L.D. and **A. E. Ewing,** A. M., M.D. Paper, 24 pages, 35 engraved plates. St. Louis: C. V. Mosby Company.

This is, in effect, an edition of optotypes previously noticed (vol. 6, p. 789), making them available to all who are engaged in sight testing. The loose leaf binder, in which they are put out, can be hung up for wall testing, or the individual cards can be removed for separate use. The test letters, which are printed on ten cards (both sides), are the series suggested many years ago by Dr. Green, and visible by standard vision at 2 to 80 meters. They differ in size by regular geometric progression, and include the simpler forms of the New York Block Letter Capitals, instead of exact imitation of those used by Snellen. The pictographs, to be used for young children and other illiterates, occupy six cards, and there is a card of Arabic numerals. The test proposed by Ewing, a square containing three parallel lines of which the center one may be interrupted, is also given on two of the cards. A key card gives the various pictographs used. It is to be held in the hand of the person examined, and the figure seen on the test card pointed out. This is useful in testing very young children and deaf mutes.

One who does much subjective testing of refraction, needs a wide variety of test cards. These, with standard letters, well printed, will certainly prove useful; and the substantial binder, less than 9 by 15 inches, makes them very easy to carry about.

E. J.

Our Own and Our Cousins' Eyes. T. H. Shastid, M.D., F.A.C.S., Ll.D., Duluth, Minn. Cloth, 33 pages. Published by the American Optical Company, Southbridge, Mass., 1926.

This book is a reprint of a lecture delivered at the Mayo Clinic in 1925. Written in the author's lucid style, it presents the subject of evolution of the eye in language as free as possible from technicalities. Its development is traced from the ameba to the amphioxus, and the author points out that

it then apparently started out ab initio to develop into the eye of man, and the even higher state of the bird's eye. He points out that the eye of man is even now probably in a state of flux, and gives his prediction of its future as a cyclopean eye of enhanced utility. The lecture is naturally sketchy, but is most interesting and instructive. (See also p. 71.) C. L.

The American Association of Vienna, 1925. Published by Volkesbuchdruckerei. Vienna V, Margaretenplatz 7, Paper, 168 pages.

For the physician who is planning to supplement his knowledge by a course of study, this book is filled with most valuable information pertaining to Vienna study. The office of the Association is IX Spitalgasse, 21; the President for 1925 was Dr. G. E. Knappenberger and the Secretary Dr. H. M. Kirschbaum. A brief history of the Association is given, and its Constitution and By-laws. This is followed by general information, both medical and civic. About 50 pages are devoted to statements concerning courses; where they are held, the time and the instructor, and the number of students who may be accommodated. Four and one-half pages are devoted to ophthalmology and eleven to ear, nose and throat. There is probably a moral to this. The rest of the book consists of a list of members of the Association in 1923 and '24. A very useful index precedes the subject matter, and there is a separate index of instructors. No statement as to cost of this book is given, so it probably may be obtained by writing to the Secretary.

C. L.

Contribution to the Art and Science of Otology. Richard Lake, F.R.C.S. 1892-1925. 265 pages. McMillan and Co., London, 1926.

This little volume has brought together a large series of papers of one of the outstanding otologists of the English speaking world. Among the subjects discussed are the structure of aural polypi, disease of the semicircular canal, facial paralysis in recent otitis media, operations on the mastoid, anatomy and pathology of the periosteum of the ear, chronic suppuration of the middle ear, treatment of middle ear deafness, testing the hearing with higher tuning forks, earache, fixation of the stapes, etc., etc.

A number of the papers are in French, just as they appeared in the various French journals. The subjects mentioned form only a very small part of those presented in the book, in which the author covers a wide range of topics in otology. Coming as they do from the pen of so noted a man, they are not only interesting but exceedingly valuable and contain many practical points culled by him thru a long and varied experience in the practice of his specialty. Most of the articles are very short, some of them only one or two pages long. There is one on means and methods of testing aural disease which is quite extensive.

Tuning forks are discussed among other methods, stress being laid on their proper handling, their deficiences, etc. The author is disturbed by the fact that tuning forks, as a rule, have certain overtones. But it was shown long ago that either by use of weights, or by placing a thick rubber band on the distal third of the prong, or by very carefully forging the fork, overtones are, to a large degree eliminated. The book is a valuable one from a historical as well as a scientific standpoint. C. L.

Not Speaking of Operations. John Finch Barnhill, M.D., F.A.C.S., Indianapolis. Cloth, 12 mo., 163 pages. Boston. The Stratford Co., 1926.

This is fiction, based on a wide and exact knowledge of facts. It purports to tell the story of a surgeon operated on for appendicitis, and of some of the things he learned while in the hospital as a patient. It gives a very good picture of the ideas that patients circulate after such hospital experiences. It brings out strongly how the inherited prejudice against operations works harm to children, in leaving congenital defects uncorrected when their

deformities could be most completely removed.

The book has no reference to ophthalmology, but brings out aspects of the relations of the public to hospitals, that all physicians and surgeons, specialists as well as general practitioners, have thrust upon them. Perhaps a vacation and complete escape from daily routine was necessary to enable a special surgeon to write thus of the annoyances of practice. But the book will furnish many a busy practitioner with an hour's escape from the annoyances that daily pursue him. The author's mastery of negro dialect makes "Aunt Mandy" a clear and interesting literary character.

E. J.

The Duke of Duluth. Thomas Hall Shastid. In two volumes, 1926. Ann Arbor, Mich. George Wahr.

Thomas Hall Shastid of Superior and Duluth has branched out into another field of literature; and, following the brilliant H. G. Wells and Theodore Dreiser, has done his bit to revive what we thought was forever dead—the duplex novel. This is the literary age of the short story, the condensed novel, which, like sap from a maple tree, is richer and better with boiling. Dr. Shastid, like many another writer, has done the downright unexpected, just when the Dear Public was wishing that he would "stay put." His "Simon of Cyrene" is one of the classics of modern literature, and it was hoped that he would proceed in this vein, rather than going on with the description of personalities that might step out of Main Street.

He has created a character in the Duke of Duluth, who would, I should think, prove a veritable hair shirt to the youth of today—were they to meet such an one. John Gridley Smith, a Holier-than-thou, tho callow youth, from the State "where the tall corn grows," is in spite of his high-flying banner of "Service to the World," an ordinary individual, stumbling, falling, yet ever hopefully trying to attain the heights. Supercharacters, such as Louis Bromfield's John Pentland, who believed in high honor so implicitly that he lived it inexorably to the end of his life, are best fitted to teach such principles as Dr. Shastid would like to teach in this book. John Smith's code of honor, high tho it is, has an intermediate gear, into which he very humanly and conveniently slips when occasion demands. This is entirely too human—and common. Most of the time we are either in the depths or on the heights; but we like to spend our time reading of the supermen, who soar to the heights and stay there.

John Smith is not shown as susceptible to any frailties of the flesh at all, further than that he has a most excellent appetite. His chief fault was that he was oversensitive to criticism. Accused of a crime he had not committed, he could not stay and "face the music."

John Smith inherits a fortune and proceeds to run a gamut of mostly sordid experiences. But the sordidness was not his own. He simply ran upon it in others. As a rich man, poor man, scholar, on to accused murderer, hobo, and finally, philanthropist, benefactor, and lover, he eventually merges, disillusioned but still looking toward the heights. By the time the two volumes are finished, and Shastid has his nimble John cease jumping thru his magic hoop, one wonders that the author has a solitary trick left in his voluminous bag of literary wonders.

The underlying current of the book is, "Service to the World"; exemplified chiefly by the city of Duluth. The author has so saturated his character with the personality of Thomas Hall Shastid, that he could not, in the very kindness of his heart, keep even his villain a villain, but must needs, instead, at the last minute, find a physical excuse for the miscreant's baseness, in a fracture of the skull, followed by a dual personality. His counter theme is antiservice, or criminality, exemplified by various sorts of criminals. Among these he had, for one kind, the kind that is caused by physical conditions. That kind, as all physicians know, does really exist.

The "Duke of Duluth" would be entirely satisfying from the literary

standpoint of a Victorian and will pass the time. But that is not what we expect from Dr. Shastid. We would like him to give us more of the ancient Sagas, write those stories over again, clothed with his beautiful language and thought and painted by his facile pen, as he did once in "Simon of Cyrene."

H. V. W.

Ten Weeks With Chinese Bandits. Harvey J. Howard, M.D. Professor of Ophthalmology, Peking Union Medical College. Cloth, 8vo., 282 pages, 26 plates and 6 illustrations in the text. New York. Dodd Mead and Co. 1926.

English speaking ophthalmologists felt a keen interest in the reports of Dr. Howard's capture, and the progress of the expeditions to rescue him, that reached them thru the usual news channels. But these reports were so meagre that they stimulated interest rather than satisfied it. That he lived to tell the story in full, and with graphic representation of the region and conditions under which his forced pilgrimage in Manchuria was made, is a great satisfaction. His steady holding up to the higher standards of Western medicine and Christian civilization made this a dramatic missionary adventure—a real plgrimage, a journey into the unknown that served a real international purpose. It cannot fail to have a permanent influence on the people among whom he went, and thru this book upon those of whom he was a high representative.

Altho this is a straight forward narration of facts, it has the charm and sustained, gripping, interest of romantic fiction, coming from the pens of the best writers. To get away from the pleas and demands of patients, the physician often travels to attend a medical society, or get a few weeks of graduate instruction. Seeking to forget for an hour the emergencies and routine of practice in the literature in this book, along with the understanding of strange people, and the development of human nature under barbaric conditions, the reader can feel the thrill that came from peril to its author, and share with him the lessons that the experience of such danger emphatically taught.

The needs and difficulties of human beings and the difficulties they face under such conditions, throw new light on the problems of public and personal hygiene; and illustrate the high position of medicine among the arts. It was because Dr. Howard was a physician, accustomed to meeting and combatting the dangers and disabilities that men have to struggle with, and carried in his mind the results of medical study and experience, that he found himself equal to the emergencies that confronted him; that he lived to tell his story and give us a new picture of the causes and conditions of banditry, with clues to the means of eradicating it in Manchuria, or in the higher civilizations of other countries.

There is not much of ophthalmology in it, but there are some interesting observations, of facts that would not come to our knowledge thru the ordinary channels. The prevalence of trachoma in China and Manchuria, the customs that favor its spread, and the possibilities that gave relief, without the resources commonly relied on for treatment, are brought out. The bandits received a lesson on the importance of glasses, thru the care of the captive to preserve his own. In countries that require it, general military training and service are avoided by producing corneal scars. In Manchuria, farmers have found that horses subjected to similar mutilation were not taken by the bandits, altho they remained serviceable to the farmers.

For the ophthalmologist, this book may be one for relaxation, and to give a broader outlook on the world we live in. But aside from personal interest in the writer the fact that he views life from a standpoint similar to our own, makes him a better teacher and more entertaining teller of a good story than he could be otherwise; and the insight of the author into social and international relations gives his story true cultural value. For our own sakes as well as for his we can feel thankful that Dr. Howard came back to tell his story.

E. J.

ABSTRACT DEPARTMENT

Reprints and journal articles to be abstracted should be sent to Dr. Lawrence T. Post, 520 Metropolitan Building, St. Louis, Mo. Only important papers will be used in this department, others of interest will be noticed in the Ophthalmic Year Book.

Beselin, O. Subacute Functional Disturbances of Optic Nerve and Retina by Arteriosclerosis. Klin. M. f. Augenh., 1925, Sept.-Oct., 75, p. 363.

A man, aged 65, with intense arteriosclerosis and blood pressure of 220, lost the greatest part of vision in the right eye two years ago. The examinations revealed atrophy of optic nerve and retina and intense sclerosis of the retinal arteries. V. = 1/40 eccentrically.

Three days previously vision of the left eye became impaired to 4/15, with defect of the lower half of the visual field. The disc was opaque and moderately swollen, the arteries ensheathed by white stripes with a thin blood column in the center. The central vision gradually became worse, fluctuated between 1/6 and 1/15. After two weeks the swelling of the disc subsided, but it became paler and presented the same atrophic aspect as the right.

Beselin considered the swelling as edema and the central and peripheral failure of vision due to disturbance of nutrition from insufficient blood current in the arteriosclerotic narrowed bloodvessels of optic nerve and retina.

C. Z.

Ivanoff, S. Angioneurosis of the Supraorbital Region. Klin. M. f. Augenh., 1925, Sept.-Oct., 75, p. 388.

A woman, aged 19, complained of periodic swelling of the right half of forehead and edema of the upper eyelid. The conjunctiva contained red or transparent, easily bleeding, cystic formations as did also the skin of the lids. Excised pieces of conjunctiva showed microscopically lymphangiestasia, round cell infiltration and dilatation of the bloodvessels. The supraorbital region was painful on palpation. The attacks came suddenly and disappeared in from 1 to 3 days, some were accompanied by changes of the blood and rise of temperature. Apparently it was a nervous vasomotor disturbance. **C. Z.**

Hemmes, G. D. Hereditary Nystagmus. Doctorate Thesis, Utrecht. Ill.

Typical hereditary nystagmus is not as rare as is commonly thought. The author believes that one case exists in every 6,500 of the population (the Netherlands). He has examined a number of generations of five families, with 51 persons affected. From the literature he collected more or less detailed descriptions of 26 families and from 2 colleagues he received notes of 6 more families.

The anomaly can be transmitted after two methods. In the first group both sexes are affected, and in the second the men only are affected and the nystagmus is transmitted thru the women, who themselves are free. However, it is the same disease. In different cases, head shaking appeared in a group where the transmission was thru the mother, a group which Nettleship had not accepted. Neither is Nettleship's dictum, that hereditary nystagmus and partial ocular albinismus are only transmitted thru the unaffected mother, constant. Partial albinismus and nystagmus are transmitted differently.

In the families where both sexes are affected, the condition can be present in successive generations; otherwise some generations pass before the condition shows gain. Then mostly the healthy women, free from nystagmus, are the transmitters, rarely the normal men. The sex influence is still more marked in the families, where a direct transmission from the parents to the children is present. Hemmes found 28 subjects with nystagmus, fathers of one or more children having nystagmus (mothers normal) had 50 sons, of which 18% had nystagmus and 88 daughters, of which 61% had it; he found, as opposed, 28 families, where the mother had nystagmus (father being normal). These mothers had 70 sons, of which 64% had nystagmus and 34 daughters with only 35%. In case of direct transmission 82% of the

affected children were of the opposite sex from the transmittor, and that sex predominated also among children.

The examination of the families of the other group showed 41 normal mothers, but capable of transmitting the nystagmus, had 96 diseased sons and 40 normal sons and only 90 daughters.

It cannot be said that the first born are more or less exposed than the other children.

All the affected had an associated nystagmus of both eyes; in the extreme lateral position the nystagmus becomes irregular with its quick phase towards the fixed object. In the intermediary zone, that is that of direct fixation, most of the patients had an oscillatoric nystagmus (the two phases have then the same speed and excursion). Some could keep their eyes quiet, if they fixed an object in front. Hemmes has been able to observe a patient before and some weeks after a stroke and found that the slow phase of the irregular nystagmus does not depend on a paralysis of the muscles, which have to keep the eyes in the extreme positions, but on a contraction of their antagonists. Some patients had a horizontal nystagmus, others a horizontal rotatory nystagmus, one only a typical rotatory nystagmus; this last one had also a horizontal nystagmus provoked thru occlusion of one of his eyes (latent nystagmus). All the normal members of this family have been examined, none had a latent nystagmus.

Ocular examinations have not shown scotomata, the blind spot was normal and at its normal location (2 cases excepted). There was no relative central scotoma; no Daltonism. All had reduced vision (sometimes this improved if the eye was kept quiet). Few were emmetropic, 2/3 were astigmatic, often combined with hypermetropia or myopia. The axis of the astigmatism was not related to that of the nystagmus. It is, therefore, not demonstrated that the nystagmus is the cause of the astigmatism. Trustworthy information confirmed the fact that the nystagmus was observed at birth.

Neurologic examination was negative.

Irrigation of the ear with cold water showed absence or diminution of irritability of the horizontal semicircular canals; more than once the triad deviation of the indicator finger, nystagmus and fall with dizziness was incomplete, but not in the same way in all (localization of the lesions in the vestibular nuclei?).

Most probably the tonus of the otoliths on the ocular muscles is absent in these patients, as the horizontal rotatory and rotatory nystagmus did not change with different positions of the head in which the otoliths exert their maximal and minimal pressure.

This lessened influence allows us to infer that both obliques and the recti superior and inferior (the otoliths of the saccule and utricule influence the tonus of these muscles according to Quix) are much weaker than in the normal; as the recti externi and interni are not under otolithic influence, they are like normal. The horizontal motion of the eyes depends not only on the action of the internal and external recti, but on all six muscles. The abduction of an eye in the newborn affected with nystagmus must disturb the equilibrium which normally exists between the tonus of the rectus externus (not paralyzed) and that of both obliques (paralyzed); when the deviation has overstepped a certain degree, a correction sets in and the antagonists contract. But Nature is not successful, and this contraction makes the eye deviate in opposite direction (first phase of the oscillatory nystagmus). When this deviation has surpassed the initial position a new inequilibrium is formed (nonparalyzed rectus internus and the obliques and inferior and superior recti paralyzed) and a second correction sets in thru a contraction of the abductors (second phase of the oscillatory nystagmus). In older children the quick phase of the irregular nystagmus is formed thru the fixation reflex.

E. E. B.

Jickels, C. F. Intracutaneous Aolan Therapy. Klin. M. f. Augenh., 1925, Sept.-Oct., 75, p. 434.

After observations of eight months, Jickels recommends intracutaneous aolan injections in chronic keratitis, eczematous pannus, chronic iritis and cyclitis and opacities of the vitreous, and as adjuvant to antiluetic treatment. A case of chronic iritis treated successfully with aolan is reported in detail. C. Z.

Wajid, Ali Khan. Atypical Coloboma of the Iris. Brit. Jour of Ophth., 1926, July, v. 10.

This is the record of a case in a female aged 21 years. The condition was noticed by the mother since birth. The coloboma extended to the ciliary margin. The outer half of the lens was cataractous with deep brown dots. There was no coloboma of the choroid or ciliary body. The fundus was a typical picture of syphilitic choroidoretinitis. The author's idea is that the condition was due to a local inflammatory disturbance. D. F. H.

Schmincke, A. Histology of Inflammatory Pseudotumor of the Orbit (Birch-Hirschfeld). Klin. M. f. Augenh., 1926, Feb. 76, p. 207.

A girl, aged 16, presented exophthalmus of the left eye with a hard tumor behind the inferior orbital margin, extending backward close to the bulbs. Conjunctival, ciliary and retinal vessels were congested; vision reduced to counting fingers at 2 cm. Exenteration of the orbit.

The swelling consisted of bundles of coarse fibers of connective tissue and infiltrations surrounding the vessels. It was no tumor at all, but a chronic lymphocytic and plasmocytic productive inflammatory process, obliterating Tenon's space and involving Tenon's fascia, orbital fat, muscular sheaths and periorbita. The optic nerve was not affected.

The etiology also in this case was not clear, but there was a large scar on the left cheek from which the process might have been conveyed to the orbit thru the lymphatics. C. Z.

Hildesheimer, S. Targesin in Ophthalmology. Klin. M. f. Augenh., 1926, Feb. 76, p. 267.

Targesin is a combination of colloidal silver and tannic acid. Hildesheimer in the treatment of external eye diseases could entirely confirm the good results reported from dermatologic clinics in the treatment of gonorrhea. On account of its penetration, nonirritating and angiospastic effect it is especially valuable in ophthalmology. Targesin seems to be the best remedy in the second and third stages of trachoma. C. Z.

Gerard. Burns of the Eye by Baryta. Soc. de Méd. du Nord, 1926, April, Abst. Gaz. des Hôp., 1926, v. 99, p. 1159.

These accidents are becoming more numerous, as this mineral is being used more in sugar refining. The lesions of the cornea and conjunctiva are always severe because of the twofold action of heat and cautery. The workers should wear protective goggles, and search should be made for a chemical antidote to baryta.

C. L.

Hajek, M. Nasal Accessory Sinuses. 5th Edition, 1926. Abst. of Chapter on Orbital and Ocular Complications.

Twenty-eight pages are devoted to the complications of affections of the paranasal sinuses, involving the orbit and visual organs.

The inflammations are largely traceable to direct venous anastomoses between orbit and sinuses or to extension by contact thru bone. A point is made of the protection of the orbital contents by the periosteum which frequently prevents extension beyond its thin, resistant structure which is loosely adherent to the bone everywhere except at the sutures. The usual organisms are the staphylococcus, streptococcus and pneumococcus.

Diseases of conjunctiva, cornea and lacrimal apparatus are attributed chiefly to the primary inflammation of the nasal mucous membrane.

Of those disturbances less obviously associated with sinus infection, but of most interest to the ophthalmologist,

such as involvements of the uveal tract and retina and optic nerve, the author believes the condition is rare. He quotes Kuhnt who thinks that the direct dependence of an iritis upon an accessory sinus disease possibly does not exist, but that the empyema acts as a predisposing factor in diseases of the uveal tract. Zeim's supposition that such lesions in the presence of nasal infection develop indirectly from disturbance of physiologic circulation which manifests itself as a passive congestion in the uvea, is the hypothesis which appeals most to the author.

Choroiditis and vitreous clouding he regards in the same way. Tho skeptical of the direct relationship, the author admits the occasional clearing up of the inflammation of these tissues after treatment of the sinuses.

More space is given to a discussion of retrobulbar neuritis. Admitting the enormous number of cases in the literature in which relief has followed nasal operations, Hajek is very doubtful of the definite association between the two lesions. He points out the absence of more than a very small amount of pathologic postmortem confirmations and lays especial stress on the frequency of multiple sclerosis as a cause of retrobulbar neuritis. Many cases have seemed to clear up as well without nasal interference as with nasal interference and he does not feel that the causal connection is yet proven. He is especially loathe to accept the cases of hyperplasias without pus formation.

Regarding functional disturbances, he quotes almost without comment Ziem's hypothesis that they are due to passive hyperemia in the orbit and Kuhnt's idea that they are due to absorption of infected material.

In the therapy of orbital inflammations, he regards exploratory incisions as useless and dangerous. In final consideration of the nasal treatment of retrobulbar infections of the optic nerve he says, when manifest nasal changes are present, they should be treated. If these changes are not present, radical operations on the posterior ethmoids and sphenoids should be avoided unless danger of immediate blindness exists and there is no other point of attack of treatment evident. In this case collaboration with the ophthalmologist is essential.

He concludes this chapter with the statement that the paradoxic state of affairs mentioned above is another example that in the act of healing the empirical rules over the scientific.

Notable in the chapter is the absence of reference to choked disc.

For a review of the book as a whole see the AMERICAN JOURNAL OF OPHTHALMOLOGY, 1926, Oct. v. 9, p. 784.

L. T. P.

Löwenstein, A. Origin and Treatment of Retinal Detachment. Archiv. f. Ophthalmol. 1926, Band 117, p. 130.

It must be remembered that detachment of the retina is not a disease in itself but, indeed, a symptom of prior disorders or anomalies in other ocular tissues. Altho tears in the detached retina are not uncommon, there are cases where careful examination shows no opening. It is doubtful also whether the defect in the retina always precedes the detachment; perhaps fermentative changes in the subretinal fluid after detachment are the cause of these openings. That the vitreous fluid penetrates the retina thru these openings and thus produces detachment would seem to be contradicted by the fact that the subretinal fluid contains a much higher concentration of albumin than the vitreous itself. Traumatic holes in the macula are not followed by detachment of the corresponding part of the retina. Everything points to the subretinal fluid being derived from the blood vessels of the choroid.

The disposition to retinal detachment in myopia is dependent upon the fact that the choroid, retina and vitreous do not completely fill up the volume contained in the abnormally increased scleral capsule; tonometrically, this disproportion is shown by a diminished tension. The choroid, retina and the vitreous degenerate with liquefaction of the vitreous. The degenerated vitreous with a diminished intraocular tension does not therefore

hold the retina against the scleral wall with the proper intensity and retinal detachment results. Relatively slight injuries in such eyes can lead to progressive retinal detachment. Active exudations from the uveal tract in these eyes can also produce retinal detachment; tuberculosis apparently plays a dominating role in producing retinal detachment due to its production of exudates, transudates and hemorrhages from the choroid.

The treatment depends upon the cause of the detachment. Where bands in vitreous, resulting from perforating injuries, are the cause the outlook for restoration is very slight. If a tubercular choroiditis is present, a course of treatment with tuberculin is indicated. Perhaps in all conditions, protein therapy is advisable.

The diminished tension should be combatted with a combination of the redheated galvanocautery as recommended by Lagrange together with injections of sodium chlorid solution into the vitreous, removal of the subretinal fluid and a long continued diet deficient in sodium chlorid.

H. G. L.

NEWS ITEMS

Personals and items of interest should be sent to Dr. Melville Black, 424 Metropolitan Building, Denver, Colorado. They should be sent in by the 25th of the month. The following gentlemen have consented to supply news from their respective sections: Dr. H. Alexander Brown, San Francisco; Dr. Wm. Thornwall Davis, Washington; Dr. Gaylord C. Hall, Louisville, Ky.; Dr. J. W. Kimberlin, Kansas City, Mo.; Dr. George H. Kress, Los Angeles; Dr. Edward D. LeCompte, Salt Lake City; Dr. W. H. Lowell, Boston; Dr. G. Oram Ring, Philadelphia; Dr. Charles P. Small, Chicago; Dr. G. McD. VanPoole, Honolulu.

DEATHS.

Dr. J. M. Patterson, Kansas City, Missouri, died December sixth.

Dr. John G. Oldham, Santa Monica, California, aged sixty, died September nineteenth of gastric ulcer.

Dr. N. M. Marshall, Portland, Maine, aged sixty-nine, died November fourteenth of cholelithiasis.

Dr. Thomas J. Maloney, St. Paul, Minnesota, aged forty-seven, died November twenty-fifth, following a long illness.

Dr. William R. Murray, Minneapolis, Minn., aged 57, died December 27, 1926, after infection received while performing an operation.

Dr. William M. Sweet, Philadelphia, Pa., professor of ophthalmology, Jefferson Medical College, aged 66, died December 24, of pneumonia.

SOCIETIES.

Drs. Ross H. Skillern and John M. Wheeler were the distinguished guests on the January program of the Kansas City Eye, Ear, Nose and Throat Society, St. Joseph, Missouri, on January 20.

The Utah Ophthalmological Society recently elected officers as follows: President, Dr. Edw. D. LeCompte; vice-president, Dr. A. H. Alland of Ogden; and secretary-treasurer, Dr. F. R. Slopanskey. Meetings are held on the third Monday of each month.

The Section on Ophthalmology of the College of Physicians of Philadelphia met Thursday, December sixteenth. The following presentations were made: Dr. A. G. Fewell, "A Case of Coloboma of the Optic Nerve"; Dr. Francis H. Adler, "A case of Jensen's Type of Chorio-Retinitis Juxtapapillaris"; Dr. Luther C. Peter, "A Simplified Conception of Visual Field Changes in Glaucoma"; Dr. Frederick Krauss, "Some Notes upon Subconjunctival Cataract Extraction"; Dr. J. Milton Griscom, "Exhibition of a Portable, Illuminated Test-Card"; Dr. Wm. Zentmayer, "A Further Report on a Case of Primary Sarcoma of the Iris"; Dr. George H. Cross, "A Case of Embolism of a Branch of the Central Artery of the Retina"; Dr. Burton Chance and Dr. Louis Lehrfeld, by invitation, "An Interesting Condition of the Cornea"; and Dr. T. B. Holloway, "The Use of Crutch Spectacles in Cases of Paralysis of the Levator and Superior Rectus Muscles."

The one-hundred and thirty-sixth regular meeting of the Ophthalmological and Oto-Laryngological Section of the Cleveland Academy of Medicine, was held at the University Club Friday evening, November twenty-sixth. Dr. J. W. Abbott was elected Chairman, and Dr. A. L. Stotter, Secretary, for the year 1927. The meeting was a well attended and enthusiastic one. The program of the evening consisted of the presentation of clinical case reports, by the following members of the section: Dr. R. B. Metz, "Melanosis of the Conjunctiva"; Dr. H. H.Shiras, "Epithelioma of Lid"; Dr. J. E. Cogan, "Suspected Brain Tumor"; Dr. M. W. Jacoby, "Divergent Paralysis"; Dr. Leo Wolfenstein, two cases, (1) "Dislocation of Lens in Anterior Chamber"; (2) "Coloboma of Iris and Choroid"; Dr. A. B. Bruner, "High Myopia, Thirty Diopters with Simple Glaucoma"; Dr. M. P. Motto, two cases, (1) "Penetrating Wound of Globe"; (2) a—"Dislocation of Lens"; b—"Detachment of

Retina"; c—"Synchysis, Scintillans." The cases, "Penetrating Wound of Globe." The various case reports proved highly interesting and instructive and elicited a great deal of valuable discussion.

PERSONALS.

Dr. F. M. McHugh has returned to Salt Lake City from a summer's postgraduate course of study in ophthalmology in Vienna and Paris.

Dr. W. Leroy Smith is locating in Salt Lake City to practice ophthalmology and otolaryngology. He studied last winter in Vienna.

Dr. D. L. Eastland announces the removal of his offices to 1203 Amicable Building, Waco, Texas.

Dr. Claude LaRue, formerly of Boulder, Colorado, announces the opening of an eye, ear, nose and throat section in the Highland Clinic, Shreveport, Louisiana.

Drs. Gifford, Patton, Callfas and Potts announce the removal of their office to the Medical Arts Building, Omaha, Nebraska.

A bronze plaque of the portrait medallion of Dr. James Moores Ball, has been presented to the St. Louis Medical Society. Dr. Ball was one of the founders of the St. Louis Medical Library.

Dr. J. T. Collins recently returned to Cleveland after having spent a year in postgraduate study in ophthalmology and otolaryngology in Vienna and Berlin. Dr. Collins has reopened his office in the Rose Building.

Dr. M. P. Motto, chairman of the medical section of the Reserve Officers' Association, was recently elected Second Vice-President of the Cleveland Reserve Officers' Association.

Dr. E. Nelson Neulen formerly of Astoria, Oregon announces the removal of his offices to 325 Medical Arts Building, Tenth and Taylor Streets, Portland, Oregon.

Dr. Vila Coro has been elected Director of the Laboratory of the Chicago Eye, Ear, Nose and Throat College and is on active duty in that position. He was for seven years assistant to Dr. Barraquer in ophthalmology, University of Barcelona, Spain, and for the past three years Professor of Ophthalmology, University of Barcelona.

On his return from Europe Dr. W. C. Posey of Philadelphia, accompanied by Dr. F. I. Proctor of Boston, visited the Indian reservations in the Southwestern part of the United States, in the interest of a Committee of the American Medical Association, appointed to confer with Secretary Work regarding the trachoma situation among the Indians.

MISCELLANEOUS.

It appears that Chicago has been blessed with a medical gentleman by the name of Franklin O. Carter, who has been advertising rather extensively as an eye specialist. It seems that his license was revoked by the State Board and that he was desirous of practicing, pending an appeal to the Supreme Court; but Judge Joseph B. David refused him a writ of certiorari, when shown one of his advertising circulars. The Judge said that anyone putting out a circular like that should be in jail.

The sixth intensive summer course in ophthalmology and otolaryngology will be given in Vienna in 1927. The course in ophthalmology will be given by Drs. Guist and Pillat, of Salzmann's Clinic and Professor Lauber. The course lasts for five weeks, starting June 24, 1927, ten hours each day for 30 working days, and is given in the English language. Further particulars may be obtained from Dr. George W. Mackenzie of Philadelphia.

The one hundredth anniversary of the death of Laennec was celebrated December 18th in Paris, during three days. Mass was celebrated at Notre Dame, followed by receptions at the Academie de Medicine and the Hotel de Ville. The meeting was participated in by many French scientists, paying honor to the place of Laennec in the evolution of medicine.

We are in receipt of three reprints from Dr. Franklin Royer of New York City, Medical Director, National Committee for the Prevention of Blindness. These articles deal with the question of diet as a constitutional factor in the production of trachoma. The author is not prepared to say that such bodily changes are the cause of trachoma, in opposition to the generally accepted belief that it is a transmissible disease. He points the way to the importance of research work along these lines, and believes that it is a field in which some foundation could work with profit. The thought occurs to us that animal experimentation may never lead to definite results, but that the question of its transmissibility could be easily settled if a few human beings could be experimented upon. Condemned criminals might be found willing to submit themselves to such experimentation.

The Secretary of the Interior, Dr. Hubert Work, has just announced the creation of a Hospital School, for Indian children afflicted with trachoma, at Fort Defiance, Arizona. It is determined to segregate all Indian children with trachoma. If this first attempt turns out well, similar hospital schools will be established elsewhere among the Indians. It is expected that this step will do much to stop the spread of the disease among the Indians. The afflicted children will be cared for in these institutions, until it is safe for them to return to their homes, or to mingle with others.

Current Literature

These are the titles of papers bearing on ophthalmology. They are given in English, some modified to indicate more clearly their subjects. They are grouped under appropriate heads, and in each group arranged alphabetically, usually by the author's name in *heavy-faced type*. The abbreviations mean: (Ill.) illustrated; (Pl.) plates; (Col. Pl.) colored plates. Abst. shows it is an abstract of the original article. (Bibl.) means bibliography and (Dis.) discussion published with a paper.

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